

Affording expensive ceremonies: Evidence from quinceañeras in Mexico

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Abstract

Despite their limited resources, low-income households in developing countries spend considerably on festivals and ceremonies. How do they afford this, and how do such events affect their economic outcomes? I address these questions using a coming-of-age ceremony in Latin cultures called a quinceañera. To overcome the endogeneity associated with ceremony timing, I exploit a unique feature of quinceañeras that only households with a 15-year-old girl have the ceremony. With repeated cross-sectional data from Mexico, I show that households fund quinceañeras using savings, transfers from other households, and increased labor supply by mothers. However, quinceañeras decrease the probability that households engage in non-agricultural businesses, suggesting that ceremonial expenses crowd out business resources. My study provides insights into how households facing incomplete credit markets in developing countries manage large expenditures.

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1 Introduction

It has been extensively documented that low-income households in developing countries make large expenditures on festivals and ceremonies. In Udaipur in India, for example, more than 99 percent of the poor households spend on festivals, with their median expenditures on festivals being 10 percent of their annual household consumption (Banerjee and Duflo, 2007). Conditional on having such a ceremony, its significance for a household’s budget is evident. Bloch et al. (2004), documenting wedding costs in their study area in India in 1994, find that an average wedding celebration, excluding dowry payments, cost roughly 30 percent of GDP per capita. In South Africa, Case and Menendez (2011) report that the average funeral’s cost amounts to 40 percent of an average household’s annual budget. Considering low-income households’ limited resources, liquidity constraints, and missed opportunities for productive investment, such events can impose substantial financial stresses on them and their economic activities.

Despite the topic’s potential economic importance, few quantitative studies have asked questions such as how households afford large expenditures on festivals and ceremonies and how they affect households’ lives. The lack of such studies may be partly attributable to the endogenous timing of ceremonies:¹ households may decide the timing of marriage based on the available resources (Corno et al., 2020; Hankins and Hoekstra, 2011; Salisbury, 2017), or the death of a household member could be related to income shocks to the household (Evans and Moore, 2011; Lindahl, 2005). If factors affecting the timing of festivals or ceremonies are directly correlated with the outcome of interest, it becomes impossible to identify the causal impact of such events.

This paper overcomes this endogeneity issue and conducts a quantitative analysis of ceremony expenditures in a developing country. For this purpose, I use the quinceañera, a traditional ceremony in Latin cultures. One advantage of using quinceañeras over other festivals or ceremonies is their fixed timing: quinceañeras are held when a girl turns 15 years old. This rules out the issue of endogenous timing and allows quantitative assessment of the ceremony’s impact.

Specifically, I investigate the following three questions. First, I will explore how households afford large expenditures on ceremonies. The answer to this question will provide insights into how households in developing countries manage large expenditures. For example, liquidity constraints faced by households can affect the measures they adopt, while behavioral

¹Other potential reasons for the lack of such studies include the endogeneity of ceremony sizes and the difficulty in measuring ceremony timing and expenses.

biases, such as present bias, can affect their savings preparations for future expenditures. Second, I analyze the effect of quinceañeras on household businesses. Self-employment is an important income source for many low-income households in developing countries. Therefore, the answer to this question makes an important contribution to understanding the welfare impact of the ceremonies. Finally, to explore the potential benefits of expensive ceremonies in developing countries, I examine how quinceañeras affect the strength of social networks among households.

To answer these questions, I exploit a unique feature of the quinceañera: only households with girls turning 15 years old have the ceremony. With this feature, for identification, I use a difference-in-differences analysis. The first difference is in the outcomes between households with a girl who is age 15 and households with girls of other ages such as 14 or 16. However, just comparing their differences can capture other confounding factors affecting outcomes. Hence, as the second difference, I use households with girls and those with boys of the same age. This allows me to rule out the differences due to the ages of children in households and to identify the effect of having quinceañeras on the outcomes of interest.

With repeated cross-sectional data from Mexico, I obtain three main empirical results. First, I find that, to afford quinceañera expenditures, households save in advance and receive monetary and in-kind transfers from other households, while the mothers increase the number of hours they work around the year of quinceañeras. In particular, the results show that households save resources one year before the quinceañeras and use these for the ceremony. This means that households use an intertemporal consumption smoothing method for the large expenditures on ceremonies. The use of savings for large expenses linked to a traditional cultural institution is also described by [Anukriti et al. \(2021\)](#) for dowry in India.

The fact that households only start storing resources shortly before their ceremonies suggests that they are present-biased and procrastinate about costly behavior until just before the “deadline” ([Ashraf et al., 2006](#); [Duflo et al., 2011b](#); [Kaur et al., 2015](#); [O’Donoghue and Rabin, 1999, 2001](#)). The use of transfers from other households for ceremony expenditures offers insights into the role of risk-sharing in such societies. Previous studies have pointed out the role of risk-sharing networks for households having to deal with economic shocks in developing countries ([Angelucci and De Giorgi, 2009](#); [Ligon and Schechter, 2020](#); [Ligon et al., 2002](#); [Townsend, 1994](#)). My finding suggests that risk-sharing networks help households cope with large expenditures for quinceañera ceremonies.

[Anukriti et al. \(2021\)](#) observe that Indian households anticipating large expenditures increase their supply of labor. Whereas they report an increase in fathers’ labor supply to

prepare for future dowry payments, I find that it is mothers who increase their work hours to help fund quinceañera ceremonies. This difference could be born out of the difference in labor markets for women: Mexico has a substantially higher female labor force participation rate than India. This may allow Mexican women greater flexibility to adjust their work hours according to their needs.

Secondly, households are more likely to shut down their non-agricultural businesses (manufacturing, retail, or service) in the year of quinceañeras. This could be because households facing credit constraints are forced to close their businesses if they cannot pay the upfront fixed costs of their operations. In other words, expenditures for business operations could be crowded out by quinceañera ceremonies. This is consistent with the previous findings that small and medium enterprises in developing countries are likely to close down in response to economic shocks (Davies and Kerr, 2018; De Mel et al., 2012; McKenzie and Paffhausen, 2019).

Finally, I find no evidence that the strength of households' social networks is affected by having a quinceañera. There are several possible explanations for this finding. First, the actual size of the quinceañera ceremony could be crucial in changing households' connections with neighbors. Second, the questions in the survey may not have sufficiently captured the strength of social networks; more detailed network information may be required to investigate changes in social networks. Exploration of these possibilities is left for future research.

A series of robustness checks confirm that the paper's findings are unaffected by changes to sample restriction rules or to the definition of the main variables of interest. Furthermore, I explore potential determinants of ceremony sizes. In particular, I analyze the effects of permanent and transitory income on quinceañera ceremony sizes. I obtain suggestive evidence that, while households with higher permanent income spend more on quinceañeras, transitory income shocks have little impact on quinceañera expenditures. This suggests that the size of the quinceañera ceremony may be determined less by the resources currently available to the household and more by the expectation of how large the ceremony should be given the household's wealth.

This paper mainly contributes to the literature on conspicuous consumption, particularly on ceremony expenditures. Previous theoretical work has assumed that households gain utility from their social status and use conspicuous consumption to signal it (Bloch et al., 2004; Moav and Neeman, 2010). Empirical studies primarily have focused on the determinants of such spending and conspicuous consumption. For example, Bloch et al.'s (2004) examination of the determinants of expenditures on wedding ceremonies in India finds suggestive

evidence that a bride’s household uses its spending on a wedding ceremony to signal to their community the social characteristics of the groom’s household. [Brown et al. \(2011\)](#) analyze festival expenditures in rural Chinese villages; their results suggest that people spend on ceremonies to keep up with their neighbors. [Grier et al. \(2016\)](#) show that unmarried male consumers who face an unfavorable sex ratio purchase more expensive cars; this suggests that expensive cars play a signaling role for better marriage outcomes.

What is missing from the literature is an analysis of the causal impacts of ceremonial expenditures on economic outcomes. This is partly due to the endogeneity discussed above, which I am able to overcome through my empirical design. One of the few studies on the causal impact of a festival in a developing country is [Montero and Yang \(2020\)](#). They explore how Catholic Saint Day festivals in Mexico affect agricultural production and economic development. For identification, they exploit an exogenous variation across municipalities in the timing of the festivals. They find that municipalities in which the festivals overlap with planting and harvest periods have poorer economic performance. One potential channel argued in their paper is that festival expenditures crowd out productive investments. My study complements their research by ascertaining whether household-level ceremonies similarly affect the operations of household businesses. Unlike village-level festivals, expenditures on household-level ceremonies are idiosyncratic rather than aggregated, which provides room for cost-sharing among households. I explore whether such cost-sharing occurs, and how resilient household businesses are in the face of such large expenditures. Furthermore, to explore the potential benefits of large ceremony expenses, I analyze the effect of quinceañeras on social networks.

A similar but distinct literature is that on marriage payments such as dowry and bride-price; see [Anderson \(2007a\)](#) for a review. Although much of the literature has focused on theoretical analyses of marriage prices ([Anderson, 2007b](#); [Anderson and Bidner, 2015](#); [Botticini and Siow, 2003](#)) and empirical analyses of changes in dowries ([Edlund, 2006](#); [Rao, 1993](#)), there have been recent studies into the effects of marriage payments ([Alfano, 2017](#); [Anukriti et al., 2021](#); [Bhalotra et al., 2020](#); [Corno et al., 2020](#); [Menon, 2020](#)). Partly due to the endogenous timing of marriage payments, these causal studies explore their effects of potential future expenses. For example, [Alfano \(2017\)](#) explores the effect of potential future dowry payments on fertility choices in India. Unlike a potential future marriage, the timing of a quinceañera is fixed. This allows the contemporaneous effect of large ceremonies to be investigated.

This study contributes to several other areas. First, the answer to how households cope

with huge expenditure on quinceañeras is related to intertemporal consumption smoothing, which has been studied by authors such as [Deaton \(1991\)](#) and [Zeldes \(1989\)](#). [Horioka and Terada-Hagiwara \(2017\)](#) show that in India and South Korea, as the marriage market becomes more competitive, households save more for dowries to be successful in the marriage market. Similarly, using the gender of the first-born child and the expected dowry amounts in marriage markets, [Anukriti et al. \(2021\)](#) find that households save to prepare for future marriage payments. These studies suggest that households use savings to prepare for a “shock” in advance, consistent with my empirical findings.

Second, the analysis of the ceremony’s effects on social networks has an implication for our understanding of how households develop their social networks. In the literature on risk-sharing, ample work has been done on how effectively people share risks ([Townsend, 1994, 1995](#); [Udry, 1994](#)) and what prevents people from fully sharing risks ([Coate and Ravallion, 1993](#); [De Weerd et al., 2019](#); [Doepke and Townsend, 2006](#); [Kocherlakota, 1996](#); [Ligon, 1998](#); [Ligon et al., 2002](#)). Less studied, with a few exceptions such as [Attanasio et al. \(2012\)](#), [Fafchamps and Gubert \(2007\)](#), and [Fafchamps and Quinn \(2018\)](#), is how people develop their networks to share risks. I attempt to explore the possibility that having large ceremonies affects social networks. My empirical result shows that quinceañeras have a limited effect on the strength of social networks. This could be because the size of the ceremony, not just whether the household has a quinceañera, could be significant in changing social networks.

This study proceeds as follows. Section 2 introduces the background to quinceañeras. Section 3 discusses the conceptual framework of this study, and data are introduced in Section 4. Section 5 presents the empirical approach, and Section 6 shows the results. Section 7 provides robustness checks and additional analyses. Section 8 concludes.

2 Background

In both developed and developing countries, many cultures have coming-of-age ceremonies, and quinceañeras are one such ceremony: in Latino cultures, when girls turn 15 years old, households have ceremonies to celebrate their coming of age.² Quinceañeras are considered “the passage . . . from childhood to adulthood” ([Tatum, 2014](#)). While the size of the ceremony depends on various factors, such as the family’s wealth, many households hold quinceañeras to celebrate this critical time in women’s lives.

²The term quinceañeras is used both for a girl turning 15 years old and for the ceremony. In this paper, I use the term to describe the ceremony.

Historically, quinceañeras were held to publicize girls' availability for marriage (Plummer, 2007). Napolitano (1997) provides an example of a family with a girl turning 15 living in an urban area; the parents held their daughter's quinceañera in the rural village from which they had migrated, and expressed their wish that the daughter would marry someone in the village. Existing studies have also pointed out that quinceañeras play a role in sending various signals to the community. Quinceañeras are used to demonstrate family status and prestige (Napolitano, 1997) and families do everything to distinguish themselves within their group (Sarricolea Torres and Ortega Palma, 2009). This is partly why the cost of quinceañeras is often high, as seen below.

The ceremonies provide an opportunity for relatives and friends to interact. A quinceañera usually consists of two parts: the religious Mass and the party. The former is a blessing in church, and the latter includes catering, drinking, music, and dancing, among other things. The party can be especially costly since households may rent a hall, invite a band for music, provide food and alcohol, purchase a dress for the daughter, and hire a private dance instructor. Moreover, since relatives and friends are invited, the party's size and cost can be enormous. Although data is scarce, according to Napolitano (1997), in Mexico, the cost of a quinceañera was at least 1,500 Mexican Pesos in 1994 value, which was approximately 25% of GDP per capita at that time.

In this paper, I explore how households in developing countries manage to pay for large expenditures on ceremonies and how such expenditures affect households' economic lives. Quinceañeras are useful events to answer these questions for the following reasons. First, as documented in the previous anthropological and sociological studies, and as I will show later, quinceañeras are costly and hence potentially affect various aspects of households' lives. This makes it important to answer how households in Mexico afford the ceremonies and what the consequences of quinceañeras are.

Second, the timing is fixed and clearly determined. This allows me to identify whether a household had a quinceañera in the survey year based on the age of a girl in the household. Furthermore, as discussed in Section 1, the endogenous timing makes it difficult to obtain causal interpretations from other ceremonies such as funerals and weddings. Therefore, the fixed timing of quinceañeras helps me identify the effect of the ceremony on outcomes of interest.

Third, only households with a 15-year-old girl hold ceremonies, not those with a boy of the same age. This allows me to use households with boys as comparison groups and to control for the effect of just having a child at a certain age. For example, having an additional adolescent,

whether a boy or a girl, in a household can affect the social network with neighbors since interactions among children can help parents develop stronger connections. Since this has nothing to do with having a quinceañera ceremony, I use households with a boy to control for such effect.

In summary, quinceañeras are expensive and provide a unique opportunity to answer my research questions. The next section will discuss my research questions and potential answers to them, which will be empirically tested in later sections.

3 Conceptual Framework

In this paper, I answer the following three questions; how households afford large expenditures for ceremonies, how quinceañeras affect household business operations, and how quinceañeras affect the strength of social networks between households.

How do households afford large ceremony expenditures?

To investigate how households in Mexico afford quinceañera expenditures, I propose the following five possibilities. First, households may use savings to prepare for their quinceañera expenditures since they know in advance that they will need a vast payment for their daughters' ceremonies. It has been documented that poor households use various saving modes for large lumpy expenditures (Collins et al., 2009). Anukriti et al. (2021) find that, after having a daughter, Indian households increase their savings in preparation for future dowry payments. Similarly, Mexican households may save resources when anticipating large expenditures on ceremonies.

Second, households can receive monetary or in-kind transfers from other households. In Mexico, “sponsors” called *padrinos* or *madrinas* are chosen from friends or neighbors to sponsor large events such as quinceañeras. These sponsors are expected to contribute to the costs of ceremonies (Davalos, 1996), and households may use aid from them to fund quinceañera ceremonies. If the quinceañera ceremony is considered as an economic “shock,” then such inter-household transfers appear as a form of risk-sharing. Similar risk-sharing behavior has been widely observed in various developing countries (Angelucci and De Giorgi, 2009; Ligon and Schechter, 2020; Ligon et al., 2002; Townsend, 1994). Households in my study context may use transfers to deal with the expenditures on quinceañeras.

Third, households may increase their labor supply to earn more income. For example, Anukriti et al. (2021) find that in India, after having daughters, fathers increase their labor

supply, but mothers do not. The authors argue that this may be due to stagnant female labor force participation in India. The change in the father's labor supply is found more significant in areas where expected dowry payments are larger, suggesting that the household needs to increase income and save resources for future payment of dowries. It is feasible that Mexican households would similarly increase their labor supply to augment their incomes around the year of quinceañeras.

Fourth, households might reduce consumption in the year of quinceañeras, or for some time after the ceremony. If there is no change in available resources, and no access to intertemporal consumption smoothing, then reducing consumption is the only thing households can do to afford quinceañeras.

Finally, they may fund their ceremonies by borrowing money from neighbors or financial institutions. Previous studies have pointed out the importance of both informal and formal credit for people in developing countries (Collins et al., 2009; Udry, 1994). To deal with large expenditures for the ceremony, they may borrow money and repay the debt in later periods.

How do ceremonies in developing countries affect household businesses?

This paper also explores the effect of quinceañeras on the business operations of households. I analyze their effects on agricultural and non-agricultural production (manufacturing, retail, and service) separately. There are several considerations in this analysis. First, in addition to the measures considered above, a household can fund a quinceañera by reducing its spending on business inputs, despite this being likely to reduce business revenues.

Second, households can close their businesses around the year of quinceañeras. For example, suppose that households need to pay upfront fixed costs such as the purchase of machine and equipment. With borrowing constraints, the ceremony expenditures can make it impossible for the households to pay the cost and force them to shut down their businesses. Additionally, with the reallocation of labor and resources, a household business may not reach efficient scale.³ The phenomenon of small firms shutting down has been widely observed after economic shocks (McKenzie and Paffhausen, 2019). Therefore, in addition to business inputs and outputs, I use an indicator for business operations as an outcome in the analysis.

How do the ceremonies affect the strength of social networks?

³Eastwood et al. (2010) discuss factors affecting efficient scale in agricultural operations.

The last question this study addresses is how quinceañeras affect the social networks of households. Through this exercise, I investigate a potential benefit of such large ceremonies: stronger social networks among households.

Quinceañera ceremonies, especially the party, usually have many participants. The host and guests interact, which can strengthen their social connections. There are findings in the previous studies that simple interactions can help establish social networks. For example, [Fafchamps and Quinn \(2018\)](#) find that, if judges in a business competition are randomly assigned to the same committee to judge the participants, they are more likely to have connections afterward. Other studies have found that exogenously created interaction opportunities and social connections can affect various outcomes ([Attanasio et al., 2012](#); [Centola, 2010](#); [Duflo et al., 2011a](#); [Fafchamps and Mo, 2018](#); [Sacerdote, 2001](#)).

Observing other guests at the ceremonies provides participants with information on the social networks of the host household. Previous studies have pointed out the roles of social networks to signal characteristics of individuals ([Campbell, 2014](#)), such as productivity of researchers ([Ductor et al., 2014](#)) and borrowers' quality in online peer-to-peer lending ([Freedman and Jin, 2017](#)). Anthropological and sociological studies have pointed out that quinceañera ceremonies are opportunities to signal households' economic and social status ([Napolitano, 1997](#); [Sarricolea Torres and Ortega Palma, 2009](#)). Therefore, the wealth information conveyed through the ceremonies can help households establish social network links. [Fafchamps and Gubert \(2007\)](#) find that wealth is a crucial factor for households in a mutual insurance relationship. Moreover, if households' absolute risk aversion decreases with wealth, then the wealth signaled by a ceremony can convey information regarding the risk aversion of the host household. It has been found that risk attitude plays an important role in risk-sharing network formation ([Attanasio et al., 2012](#)). For these reasons, it is possible that having a quinceañera ceremony would change the social networks of the hosting households; I investigate this possibility.⁴

4 Data

In this study, the primary treatment variable is the number of 15-year-old girls in a household. However, only a small percentage of households have any such girls. In the data analyzed,

⁴The effect described in this paragraph may not be captured in my analysis of how having quinceañeras affects the strength of social networks. Larger and smaller ceremonies than average can counteract each other and make the average effect small in magnitude. An analysis of the impact of the size of quinceañeras might be required to find this effect. This point will be discussed later in detail.

only 4.2 percent of households have a girl aged 15. This can bring up a concern for the precision of the estimated effects of quinceañeras. To overcome the problem, I use data with a large sample size for estimation with precision.

The main dataset for the analysis is the Mexican Household Income and Expenditure Survey (Encuesta Nacional de Ingresos y Gastos de los Hogares: ENIGH). This is a repeated cross-sectional dataset. The surveys are nationally representative and conducted by the National Institute of Statistics and Geography (Instituto Nacional de Estadística y Geografía: INEGI) of Mexico. They collect detailed information on households' economic activities, such as consumption (including ceremonial expenses) and income. In addition, socio-demographic details of household members, such as gender and age, are collected.

INEGI initiated the survey in 1984, and has conducted surveys biennially, with a few exceptions, since 1994. In this study, I use 17 rounds of surveys between 1984 and 2018 for most analyses. If information about a variable was not collected in some periods, I use the subset of the 17 rounds of surveys where the information was collected. I restrict the sample to households with at least one child between 8 and 17 years old. This makes the sample households relatively homogeneous in the sense that all the households in the analysis have at least one child of similar age. ENIGH is complemented by the Annual Consumer Price Index (CPI) in Mexico from the Federal Research Bank of St. Louis to convert monetary values to real terms.

In the analysis of how households afford quinceañera expenditures, I use the following outcomes: (i) net withdrawals (withdrawals minus deposits) from savings in bank accounts or stored at home or with an informal loan club (*tandas*) for the past six months,⁵ (ii) net transfers from other households (in-transfers minus out-transfers, not including remittances from abroad and transfers through welfare programs) for the past six months, (iii) working hours of fathers and mothers for the past week, (iv) household consumption excluding expenditures on festivals and ceremonies for the past six months, and (v) net borrowing from other households and financial institutes (received loans minus given loans) for the past six months.

In the analyses on the crowding-out effect of quinceañeras on business operations, I use inputs and outputs for agricultural and non-agricultural businesses separately. Inputs include payments for labor of non-household members, but not those of household members. When ascertaining whether households shut down their businesses around the year of quinceañeras, I also use an indicator for business operations, agriculture and non-agriculture separately, as

⁵This does not include the change in physical assets such as livestock and jewelry.

outcomes.

Finally, information on the strength of social networks is drawn from the answers to five questions in the survey. I conduct a principal component analysis (PCA) using these answers; the first principal component is used as a measure of the strength of social networks. The five questions are (i) “How difficult would it be for you to get help finding a job?”, (ii) “How difficult would it be for you to get help caring for yourself during an illness?”, (iii) “How difficult would it be for you to borrow the amount of money that you usually earn per month?”, (iv) “How difficult would it be for you to get help to accompany you to go to the doctor?”, and (v) “How difficult would it be for you to get help improving your neighborhood or community?”⁶ Note that these questions ask about the availability of help in general, not from a specific type of person. Households’ answers can take five values, where 1 is “impossible” and 5 is “very easy.” To account for differences in the trend of answers in different years, the PCA is applied separately for each survey year. One potential problem of this approach is that the answer values only have ordinal meanings; treating them as cardinal numbers can be inappropriate. To deal with this concern, I also use categorical PCA (Linting and van der Kooij, 2012) for summarizing the answers to the network-related questions. The weights used in the PCAs are shown in Tables A.1 and A.2.

In addition to the variables above, I use ceremony expenditures to ascertain whether households with a 15-year-old girl spend more on ceremonies overall as a result of their spending on the quinceañera. The dataset records households’ expenditures on ceremonies in the six months prior to the survey. A girl whose birthday was more than six months before the survey date would probably not have her quinceañera expenditures reflected in the data.

Table 1 shows the summary statistics of the main variables used in the analyses. For the net withdrawal and net loan variables, I use the information collected in surveys after 2000. For business-related variables, and for measures for the strength of social networks, the information in surveys after 2008 is used. For the working hours of fathers and mothers, I use data after 2010 and restrict the analyses to households in which children between 8 and 17 years old have the same father or mother.⁷

The table shows that households with a 15-year-old girl spend significantly more on ceremonies compared to other households. This means that nontrivial resources are devoted

⁶Households with children under 12 years old are also asked about the difficulty of obtaining help to take care of their children. I do not include the answer to this sixth question in calculating the PCA.

⁷Among households with at least one 8-17-year-old child, 32% and 14% do not have a unique father or mother, respectively, of the children.

to quinceañeras. The table also provides suggestive evidence on how the households afford quinceañeras. For example, the difference in net transfers from other households suggests that households use such transfers to meet the costs of the ceremony. Furthermore, while there is no significant difference in fathers' work hours, mothers work for significantly longer hours if a household has a 15-year-old girl, which can increase resources for quinceañera ceremonies. However, these differences could be due to factors that have nothing to do with quinceañeras, such as the age and gender of a child in a household. In the empirical analyses below, I account for these potentially confounding factors to identify the impacts of quinceañeras.

5 Empirical Strategy

In this study, I identify the effect of quinceañeras on various outcomes. One approach is to compare outcomes of households with a daughter before and after having a quinceañera. However, this comparison may reflect the difference between households having a younger and an older child. For example, as a child gets older, the household experiences more interactions with other households, which may increase the size of transfers between them. To deal with this concern, I compare households with daughters and households with sons of the same age and then analyze how their differences change around the year of quinceañeras. In this sense, I use a difference-in-differences method as an identification strategy: I use the difference between households with a daughter versus a son, and I also use the difference between households with a child at different ages.

Based on this idea, I run the following regression equation:

$$E_{ijt} = \sum_{h=8}^{17} \alpha_h G_{ijt}^h + \sum_{h=8}^{17} \beta_h C_{ijt}^h + X_{ijt}\gamma + \mu_j + \tau_t + \epsilon_{ijt}, \quad (1)$$

where E_{ijt} is the outcome variable of a household i in a municipality j in year t and X_{ijt} is household-level controls. The main right-hand side variables are G_{ijt}^h , an indicator for having an h -year-old girl, and C_{ijt}^h , an indicator for having an h -year-old child (girl or boy).⁸ I use children up to 17 years old since, once above that age, they may marry and leave the household, which could cause a selection problem. The household characteristics include

⁸In my data, 2.7% of the households have more than one child of the same age and gender, likely due to multiple birth. In a robustness check in Section 7.1, I use the numbers of h -year-old girls and children in a household instead of indicators in regressions.

Table 1: Summary Statistics

	All		HHs w/ 15yo girl		HHs w/o 15yo girl		Diff. (SE)
	Obs.	Mean (SD)	Obs.	Mean (SD)	Obs.	Mean (SD)	
Ceremony expenditures	187,358	0.15 (1.68)	16,191	0.69 (4.43)	171,167	0.10 (1.10)	0.59*** (0.03)
Total income	187,358	41.20 (55.13)	16,191	41.73 (69.67)	171,167	41.15 (53.55)	0.58 (0.56)
Total consumption (w/o ceremony)	187,358	28.36 (28.57)	16,191	29.23 (32.47)	171,167	28.27 (28.17)	0.96*** (0.26)
Net transfer (in-transfer - out-transfer)	187,300	0.54 (4.54)	16,186	0.68 (6.37)	171,114	0.52 (4.33)	0.16*** (0.05)
Net withdraw (withdraw - deposit)	151,394	-0.98 (21.34)	12,616	-0.79 (13.08)	138,778	-0.99 (21.94)	0.21 (0.13)
Net loan (borrow - lend)	151,394	0.47 (6.77)	12,616	0.52 (4.97)	138,778	0.46 (6.91)	0.05 (0.05)
Any agriculture production	104,238	0.14 (0.35)	8,359	0.16 (0.37)	95,879	0.14 (0.35)	0.02*** (0.00)
Agriculture cost	104,238	0.67 (8.26)	8,359	0.82 (11.31)	95,879	0.66 (7.94)	0.16 (0.13)
Agriculture revenue	104,238	1.20 (12.77)	8,359	1.49 (17.96)	95,879	1.17 (12.22)	0.32 (0.20)
Any non-agriculture production	104,238	0.25 (0.43)	8,359	0.25 (0.43)	95,879	0.25 (0.43)	-0.00 (0.00)
Non-agriculture cost	104,238	5.53 (34.35)	8,359	5.13 (24.97)	95,879	5.56 (35.05)	-0.43 (0.30)
Non-agriculture revenue	104,238	8.56 (45.34)	8,359	8.10 (32.42)	95,879	8.60 (46.29)	-0.49 (0.38)
Social network strength (First principal component from PCA)	104,229	0.33 (1.35)	8,359	0.56 (1.26)	95,870	0.30 (1.35)	0.26*** (0.01)
Social network strength (First principal component from categorical PCA)	104,229	0.22 (0.87)	8,359	0.37 (0.80)	95,870	0.21 (0.87)	0.16*** (0.01)
Father work hours (last week)	58,537	48.65 (17.64)	4,436	48.29 (17.79)	54,101	48.68 (17.63)	-0.39 (0.28)
Mother work hours (last week)	76,251	21.14 (23.02)	5,836	22.39 (23.14)	70,415	21.03 (23.01)	1.35*** (0.32)

Notes: The monetary variables, represented by a thousand Mexican Pesos, are converted to real terms (value in 2015). For the net withdrawal (withdrawal minus deposit) and net loan (received loan minus given loan) variables, I use the information collected in surveys after 2000. For business-related variables, the information in surveys after 2008 is used. For variables of fathers' and mothers' work hours, the information in surveys after 2010 is used and only households in which children between 8 to 17 years old have a unique father or mother are included. The columns "All" include households with at least one child from 8 to 17 years old. The columns "HHs w/ 15yo girl" include households with any girl at age 15. The columns "HHs w/o 15yo girl" include households without any girl at age 15. The last column shows the difference in variables between "HHs w/ 15yo girl" and "HHs w/o 15yo girl" (the former minus the latter) and the standard errors of the differences in parentheses. "Any agriculture production" is an indicator for engaging in agricultural production. "Any non-agriculture production" is an indicator for engaging in non-agricultural businesses (manufacturing, retail, or service). The last column shows the difference in variables between households with and without a 15-year-old girl (the former minus the latter). *: 0.10, **: 0.05, ***: 0.01.

household size and the age of the household head. Fixed effects included in the regressions are municipality fixed effects (μ_j) and year fixed effects (τ_t). To account for correlations in ceremony expenditures and traditions in local communities, the standard errors are clustered at the municipality level.

The coefficient α_h captures the effect of having a girl at age h on the outcome above and beyond the effect of having a boy of the same age. In other words, the coefficients can be interpreted as the difference in the outcome between households with a girl and those with a boy of the same age. Since I am interested in how outcomes change before and after quinceañeras, I will investigate how the estimates of α_h change around the age of 15.

Note that, strictly speaking, the coefficients demonstrate the effect of having a child of a certain age and gender. In particular, α_{15} represents the difference in an outcome of households with a 15-year-old girl and those with 15-year-old boy – differences which need not be due to quinceañeras. However, for example, if the estimates for α_{14} and α_{16} are close to 0 and there is a statistically significant estimate for α_{15} , this suggests that something significant occurs only to households with 15-year-old girls but not to others. In the absence of any other such event, I interpret this as the effect of quinceañeras.

It also should be noted that not all households necessarily hold quinceañera ceremonies for girls turning 15. The regression results should, therefore, be interpreted as an intention-to-treat (ITT) effect: the effect of having an opportunity to hold a quinceañera ceremony.

One threat for identification is that some children may leave their households. In Mexico, children graduate from junior high schools (*Educación Secundaria*) in their 15th year, and they may leave home due to, for instance, marriage or migration to work after graduation. Since ENIGH does not contain information on who left the household, this can make household composition different before and after quinceañeras. The next section will show how the fraction of households with a boy or a girl changes by age and that this does not seem to be a concern.

6 Results

6.1 Large expenditures on quinceañeras

Before diving into the main results, I show that expenditures on ceremonies increase when a household has a 15-year-old girl. In other words, I empirically demonstrate that quinceañera expenditures are significant for households. Figure 1 shows the regression results with ceremony expenditures as an outcome variable. Since there are many households who have zero

expenditures on ceremonies⁹ and the distribution of the expenditures is skewed, I use the inverse hyperbolic sine (IHS) transformation.

The figure shows the estimated coefficients α_h in Equation (1): the effect of having a girl at age h on the outcome above and beyond the effect of having a boy of the same age. The point estimates for ages other than 15 are small in magnitude and, in most cases, statistically insignificant. This means that, in general, there are no significant differences in ceremony expenses between households with a boy and a girl. This is understandable since most ceremonies, such as birthday parties or graduations, are not gender-specific. On the other hand, the figure shows a clear jump in expenditures for households with a 15-year-old girl. That is, compared to households with a 15-year-old boy, those with a 15-year-old girl spend significantly more on ceremonies, and these are likely to be quinceañeras. This finding of large ceremony expenditures resonates with the results by [Banerjee and Duflo \(2007\)](#). Below, I investigate how households afford such large expenditures and how they affect households' economic lives.

It should be noted that in my data, only 8.4% of households with a 15-year-old girl reported positive ceremony expenditures; this seems low. Two potential reasons suggest themselves. First, the question in the survey asks about expenditures on ceremonies in the preceding six months. If a 15-year-old girl in a household had her birthday more than six months before the survey, then the expenditures on a quinceañera may not have been reported. Secondly, measurement errors due to misreporting of this variable can be severe. Both reasons suggest under-reporting of ceremony expenditures, and consequently that the coefficients estimated are likely to be conservative.

6.2 Identification threat: demographic composition of households

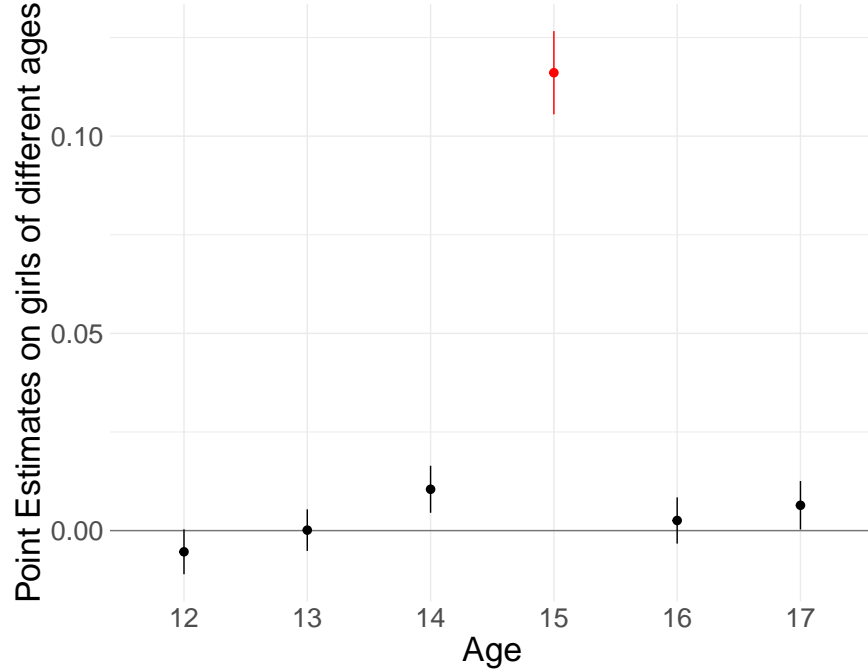
As discussed in the previous section, one threat to identification is changes in household composition. To ascertain whether this is a concern, I investigate whether household composition changes as a child gets older. Note that, since I use households with boys as a control group for households with girls of the same age, what should not change is the *difference* between shares of households with girls and boys of the same age, not the *absolute shares* of households with girls and boys.

Figure 2 shows the proportions of households with children, by their age and gender, from ages 0 to 20. This figure shows no substantial demographic change around age 15.¹⁰

⁹Only 5.0% of the households have positive expenditures.

¹⁰Starting at age 19, on the other hand, it seems children of both sexes are more likely to leave the

Figure 1: IHS ceremony expenditures by children's age and gender



Notes: Points and lines indicate point estimates and 90% confidence intervals. The outcome variable is the IHS of ceremony expenditures in 1,000 Mexican Pesos, converted to real terms (value in 2015). Control variables included in the regression are household size and the age of the household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

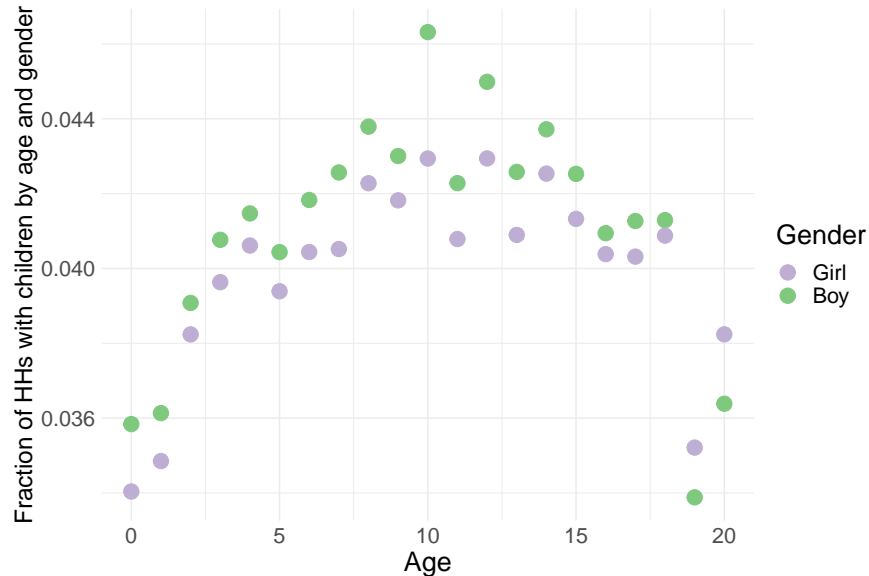
In particular, the *difference* between the proportions of households with a boy and a girl is stable. This suggests that the selection problem due to demographic changes is not of concern in the empirical analysis below.

I also conduct tests of whether such differences are statistically significantly different across ages. In Table 2, I show the p -values of equality tests for the differences in the proportion of households with a boy and a girl, for different ages. While the differences are statistically distinguishable between younger ages (12 or 13 years old) and older ages (16 or 17 years old), I do not observe any statistical difference for adjacent ages (e.g., 14 versus 15 years old or 15 versus 16 years old). In other words, if there is any discontinuous change in outcomes around the age of quinceañeras, it is not explained by demographic changes.

Another potential concern is the age heaping: it has been documented that round ages, such as multiples of 5, are excessively frequent in various surveys, especially when the populations surveyed have low human capital and numerical skills (Denic et al., 2004; Pardeshi, household, possibly due to marriage or labor migration.

2010; Tollnek and Baten, 2016). Whereas Figure 2 shows a mild age heaping at age 10 for boys, there is no irregularity at age 15, suggesting that age heaping is not a concern in the analyses below.

Figure 2: Fraction of households with children by their age and gender



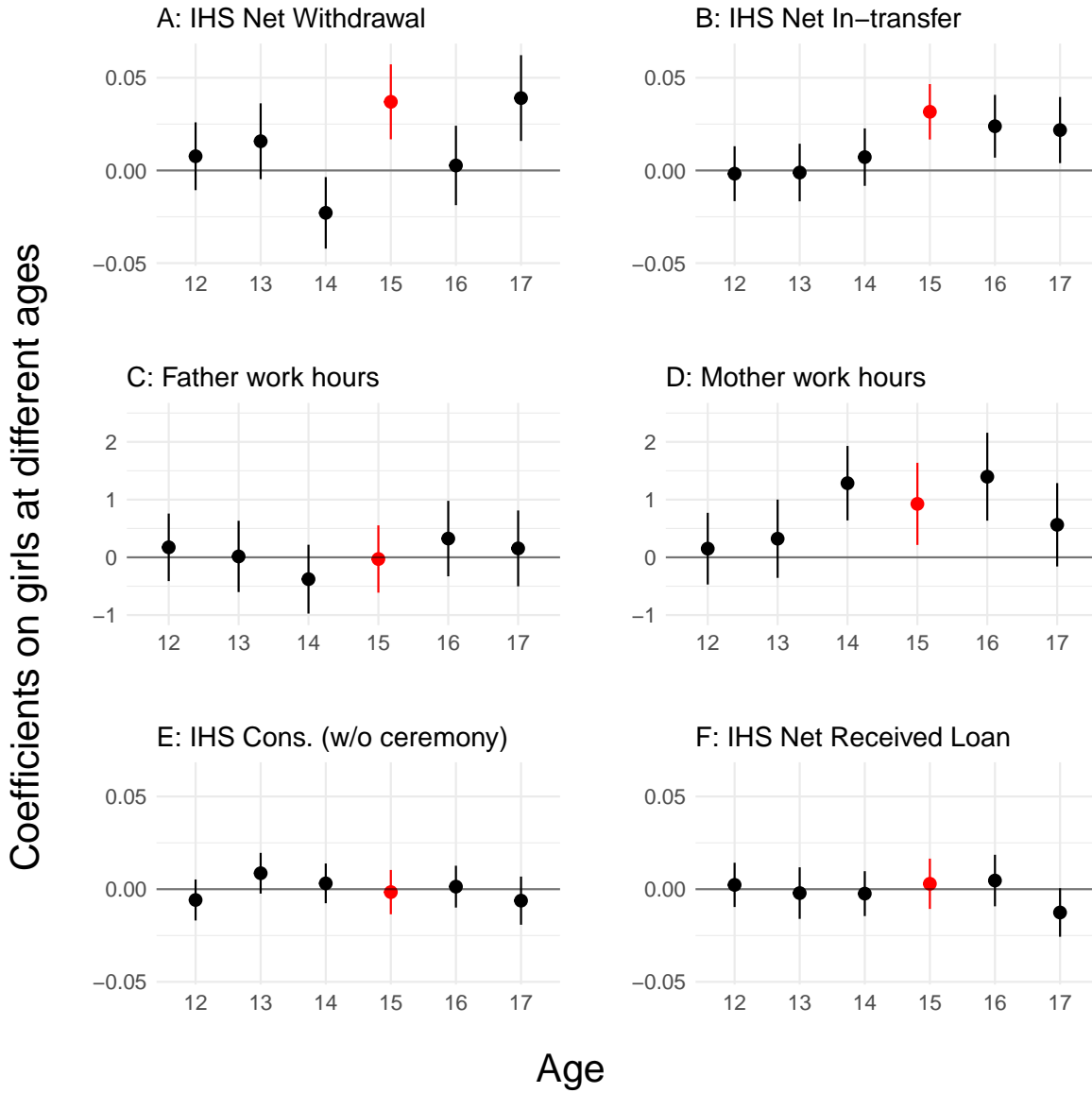
Notes: The dots indicate the fractions of households with children by their age and gender. Purple dots indicate households with a girl and green dots indicate households with a boy. In this figure, I use the full sample, not only the households with at least one 8-17-year-old child.

6.3 How households afford quinceañera expenditures

Now that I have shown that the identification assumption for regression results seems valid, I will discuss the regression results. First, I investigate how households afford quinceañera expenditures. For this, I run regression equation (1) with (i) net withdrawals from savings (withdrawals minus deposits), (ii) net transfers (in-transfers minus out-transfers), (iii) father's working hours for the past week, (iv) mother's working hours for the past week, (v) household consumption, and (vi) net borrowing (received loans minus given loans) as outcome variables. In order to take into account the skewed distributions of monetary variables (i), (ii), (v), and (vi), I use their inverse hyperbolic sine (IHS) transformations as outcome variables in the regressions.

The results are shown in Figure 3. Panel A shows the regression result with IHS of net withdrawals from savings (withdrawals minus deposits) as an outcome. Notice that this

Figure 3: How households afford quinceañeras



Notes: Points and lines indicate point estimates and 90% confidence intervals. The outcome variables are IHS of net-withdrawals (withdrawals – deposits) (Panel A), IHS of net in-transfers (in-transfers – out-transfers) (Panel B), father's work hours for the past week (Panel C), mother's work hours for the past week (Panel D), IHS of household consumption excluding ceremony expenditures (Panel E), and IHS of net received loan (received – given) (Panel F). The outcome variables in Panels A, B, E, and F, in 1,000 Mexican Pesos, are converted to real terms (value in 2015). For the analyses in Panels C and D, the information in surveys after 2010 is used and only households in which children between 8 to 17 years old have a unique father or mother are included. Control variables included in the regression are household size and the age of the household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

Table 2: Statistical tests of differences between fractions of households with boys and girls at different ages

	12	13	14	15	16	17
12						
13	0.58					
14	0.19	0.44				
15	0.20	0.46	0.98			
16	0.02**	0.08*	0.34	0.32		
17	0.09*	0.26	0.72	0.70	0.54	

Notes: The table shows the p -values from equality tests for the differences in fractions of households with a boy and a girl for different ages. I test whether the difference in fractions of households with a boy and a girl at the age in the vertical axis is statistically distinguishable from the difference in fractions of households with a boy and a girl at the age in the horizontal axis. ***: $p < 0.01$, **: $p < 0.05$, *: $p < 0.1$.

measure reflects the flow of savings and not the stock.¹¹ The panel shows a dip in the point estimate for households with 14-year-old girls, while the point estimate jumps up for those with 15-year-old girls. This means that when their daughter is 14 years old, the household saves money, and later uses it when it has a quinceañera ceremony. I consider this as evidence that households use savings to prepare for quinceañeras.

Panel B shows the result with the IHS of net in-transfers (in-transfers minus out-transfers) from other households. An upward discontinuous change is observed between households with 14-year-old girls and those with 15-year-old girls, with point estimates remaining higher even after quinceañeras. I interpret this as evidence that a household holding a quinceañera receives transfers from other households to help it afford the expenditure on the ceremony. The large point estimates after quinceañeras suggest that, since a household uses up its savings for the quinceañera, it keeps receiving transfers from other households to help cover its regular expenses.

In Panel C and D, I show how fathers' and mothers' work hours change. I find that, while fathers do not change their labor supply (Panel C), mothers supply more labor hours around the year of quinceañeras (Panel D). This results in higher earnings by mothers, as shown in Figure B.1. This is evidence that households increase their resources for quinceañeras by

¹¹ Anukriti et al. (2021) also use the flow of savings as an outcome variable in their main regressions to analyze how savings change in response to needs for future dowry payments.

increasing mothers' labor supply.

Panel E shows the regression result with the IHS of household consumption. I exclude ceremony expenditures since the purpose of this analysis is to ascertain whether households reduce non-ceremony expenses to help fund quinceañeras. The point estimate is tiny in magnitude, and no change in the point estimates is observed before and after quinceañeras.

Finally, Panel F shows the result of the IHS of net received loan (received minus given) from other households or financial institutions. The point estimates are small, and there is no change in estimates before and after quinceañeras. This suggests that households do not use borrowing to fund quinceañeras.

In summary, to afford large expenditures for quinceañeras, households save in advance, and receive transfers from other households, while mothers increase their labor supply. The finding that households use savings for ceremony expenditures is consistent with the result in Anukriti et al. (2021) that Indian households with girls save resources for future dowry payments. Procrastination may prevent households from saving until just one year before quinceañeras. It has been shown, both theoretically and empirically, that people with present bias procrastinate on costly tasks (Ariely and Wertenbroch, 2002; O'Donoghue and Rabin, 1999, 2001). Previous studies have found evidence of present bias in the context of developing countries (Ashraf et al., 2006; Duflo et al., 2011b; Kaur et al., 2015).¹² The finding in Panel A in Figure 3 suggests that, with present bias, households in Mexico may procrastinate saving for quinceañeras until shortly before their ceremonies.

The observation that households receive positive net transfers from other households accords with the local tradition. As mentioned in Section 3, in Mexico, sponsors called *padrinos* and *madrinas* are expected to help pay for important events such as quinceañeras. Since these sponsors are usually chosen from friends or neighbors of the households, their support can be captured in Panel B of Figure 3. This finding also suggests the function of risk-sharing networks in this context (Ligon and Schechter, 2020; Ligon et al., 2002; Townsend, 1994). Considering the expenditures for quinceañeras as negative economic “shocks,” the inter-household transfers can be thought of as risk-sharing.

The result that mothers supply more labor around the year of quinceañeras, but fathers do not, contrasts with the finding in India by Anukriti et al. (2021). They find that to prepare for future dowry payments, while fathers work more after a daughter is born, mothers do not change their work hours. This difference could be born out of the difference in female labor

¹²Survey data collected by Wang et al. (2016) indicate a high degree of present bias among Mexican university students.

markets in India and Mexico. According to World Development Indicators, in 2018, while the female labor force participation rate in India was a mere 20.7%, the rate in Mexico was 44.1%. Mexico’s more inclusive labor markets for women may mean that Mexican mothers can change their work hours more easily than mothers in India. The increase in maternal labor supply when daughters are 14 years old also explains how households source their savings before quinceañeras (Panel A).

On the other hand, I find no evidence that households reduce non-ceremony consumption or use borrowing to afford ceremony expenditures. One reason could be that the measures already described (saving, transfers, and increased maternal labor supply) provide sufficient funding, making other measures unnecessary. The absence of borrowing may also suggest the existence of credit constraints in the study context.

6.4 Effects on business operation

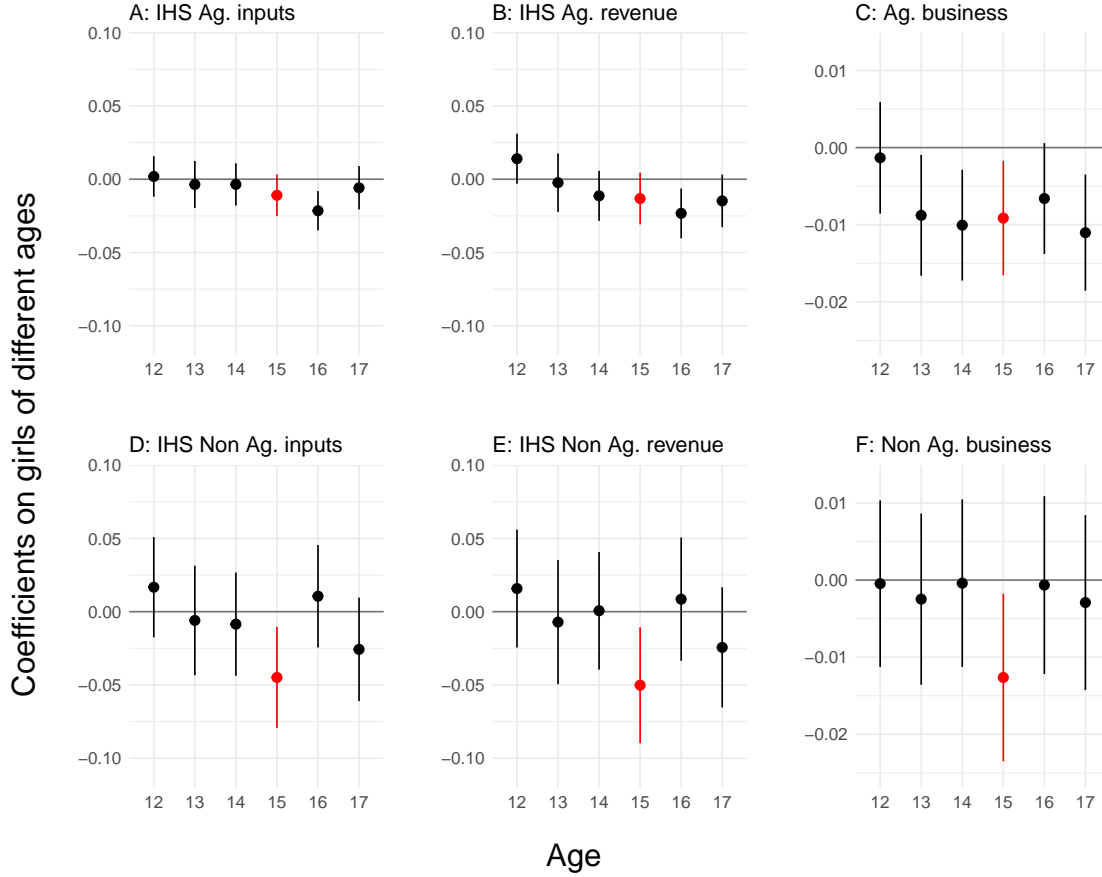
Another possible measure that households can use to fund quinceañera ceremonies is to change inputs in household businesses. This can affect the output of the businesses and, if there are fixed costs for business operation, households may shut down their businesses. As documented by [Montero and Yang \(2020\)](#), festivals and ceremonies in developing countries can negatively affect economic activities, which can, in turn, slow economic development. Here, I explore whether quinceañeras affect the business activities of households.

Figure 4 shows the regression results with business inputs, revenues, and indicators for business operations as outcomes. Panels A, B, and C show regression results for farming households. The point estimates in these regressions do not show any change around the year of quinceañeras. This suggests that households do not change agricultural business operations for the ceremonies.

In panels D to F, regression results for non-agricultural household business are shown. In contrast to the household agricultural businesses, they show a distinctive decrease in inputs and revenues in the year of quinceañeras (Panels D and E). Panel F shows that when a girl in a household turns 15 years old, the household is more likely to shut down its non-agricultural business.

Why do households quit their non-agricultural businesses when they have quinceañera ceremonies? One explanation could be that the quinceañera expenditures crowd out available resources for household businesses. For example, households may need to pay the upfront fixed costs for their non-agricultural businesses. If they face credit constraints, the expenditures for quinceañeras could make it impossible for the households to finance the cost. In

Figure 4: How quinceañeras affect business inputs and outputs



Notes: Points and lines indicate point estimates and 90% confidence intervals. The outcome variables are IHS of agricultural inputs (Panel A), IHS of agricultural revenues (Panel B), an indicator for engaging in agricultural production (Panel C), IHS of non-agricultural inputs (Panel D), IHS of non-agricultural revenues (Panel E), and an indicator for engaging in non-agricultural business (Panel F). The outcome variables in Panels A, B, D, and E, in 1,000 Mexican Pesos, are converted to real terms (value in 2015). In Panels A, B, D, and E, if a household does not engage in a business, the outcome values are recorded as 0. Control variables included in the regression are household size and the age of the household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

this case, the households are forced to close down their businesses.

If the payments for quinceañera ceremonies are treated as economic “shocks,” the findings are consistent with previous studies. For example, using panel surveys from twelve developing countries, [McKenzie and Paffhausen \(2019\)](#) find that economic shocks (e.g., a reduction in product demand and increases in input prices) and household shocks (e.g., illness of household members) increase the probability that households close their non-agricultural businesses. They also find that such business shut-downs are not permanent; within a short period, households tend to restart their businesses. This resonates with my finding that, in the years after the year of quinceañeras, households with girls and boys have similar probabilities of operating non-agricultural businesses.

Unlike non-agricultural businesses, agricultural businesses may require smaller fixed costs that households have to pay every year. Instead, most of their expenditures involve the variable costs of agricultural production, such as fertilizers, pesticides, or seeds. This is likely to be the case, especially if they already own land and equipment for farming. This could be a reason why Panel C in Figure 4 does not show any change in point estimates when household have 15-year-old daughters.

In summary, I find that quinceañeras crowd out resources for non-agricultural household businesses. Although the difference between households with a 15-year-old boy and girl is not statistically significant, Figure B.2 shows a decrease in non-agricultural business profits in the year of a quinceañera. This can significantly impact the lives of low-income households for whom self-employment is often an important income source.

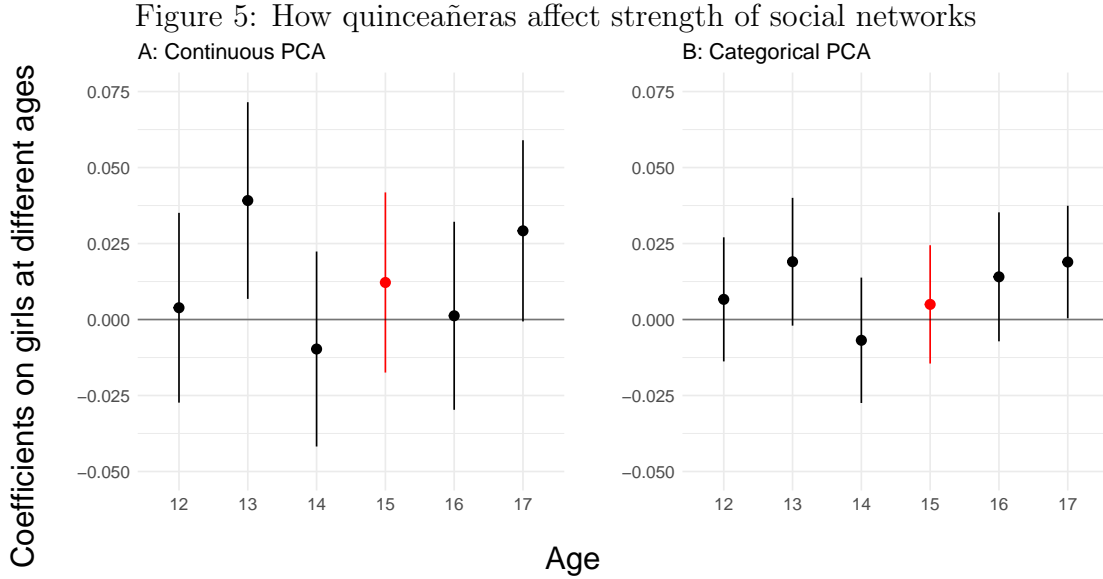
If quinceañeras impose high costs on households, why do they still celebrate them? In particular, do they provide any benefit to the households? I now turn to this question and explore one such possibility by asking whether quinceañeras strengthen social networks.

6.5 Effects on the strength of social networks

To explore whether quinceañeras change the social networks of households, I use the answers to questions about the possibility of asking for help in various situations. I use principal component analyses (PCA) to summarize these answers into a single measure of “strength of social networks.” Since the answers are categorical (1: “impossible”, ..., 5: “very easy”), I use both standard PCAs with the answers considered as continuous and categorical PCAs ([Linting and van der Kooij, 2012](#)). See Section 4 for more details on how I construct these outcome variables.

The regression results are shown in Figure 5. In Panel A, I use the first principal com-

ponent from a standard PCA, which treats the answers to network questions as continuous. In Panel B, the first principal component from a categorical PCA is used as the outcome. Regardless of the PCA calculation methods chosen, I do not see any significant change before or after quinceañeras.¹³



Notes: Points and lines indicate point estimates and 90% confidence intervals. The outcome variables are the first principal component from a PCA considering the answers to network questions as continuous (Panel A), and the first principal component from a PCA considering the answers to network questions as categorical (Panel B). Control variables included in the regression are household size and the age of the household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

There are several potential explanations for the failure to find any effects of quinceañeras on social networks. First of all, rather than the presence or absence of a ceremony, it may be the size of the quinceañera ceremony that is important in determining the household's connections with others. Anthropological studies have pointed out that quinceañera ceremonies are opportunities for households to signal their social status to the community (Napolitano, 1997; Sarricolea Torres and Ortega Palma, 2009). Having a large ceremony can send positive signals to neighbors in terms of wealth and social status. These can help to strengthen connections with other households. On the other hand, if a household has a small quinceañera ceremony, this can signal low social and economic status to other households. Such a signal may discourage neighbors from having close connections with the household for various

¹³Figure B.3 shows the regression results with answers to each social network question separately as outcomes. I do not find any consistent patterns in the effect of quinceañeras on the availability of help in different situations.

benefits, including risk-sharing or job referrals. Exploring this possibility requires exogenous factors affecting the size of quinceañera ceremonies and is left for future research.

Secondly, the questions in the survey may not sufficiently capture the strength of social networks. However, the ceremonies may provide opportunities (i) to expand the social networks or (ii) to strengthen initially weak connections. In this case, the questions in the survey are inappropriate - they cannot capture these effects of quinceañeras. The use of network data may solve these issues by, for example, ascertaining whether the network centralities of the households change after hosting a quinceañera ([Banerjee et al., 2013](#); [Hahn et al., 2015](#)).

7 Additional Analyses

7.1 Robustness Checks

I check the robustness of the results obtained above by changing the sample restriction rule and the definition of the main right-hand side variables. First, I run regressions using a different sample restriction rule. In the primary analyses in Section 6, I use households with at least one 8-17-year-old child. This sample restriction was intended to make the sample relatively homogeneous, while maintaining a sample size large enough to yield precise estimates. To increase the homogeneity of the analyzed households, now I restrict the sample to households with at least one child aged between 12 and 17 years. Whilst this alternative restriction decreases the sample size by around 30 percent, it allows comparisons between households with children at closer ages. The regression results in Figures B.4 to B.6 are qualitatively and quantitatively similar to the main results in Section 6, indicating that they are robust to the change in the analyzed sample.

Next, I explore whether the main results are sensitive to alterations in the definition of the main variables of interest in the regressions. In the regressions so far, I use the indicators for having any girl or child at a certain age as the main right-hand side variable (Equation (1)). This allows me to investigate the effects of having a girl of age h on the outcome, above and beyond the effect of having a boy of the same age. This does not take into account the possibility of having more than one child of the same age and gender in a household due to, for example, multiple births. To account for this effect, I use the number of girls and children at each age in the regressions instead of the indicators for living with any girl or child at each age. The estimates are now interpreted as the impact of having an additional girl compared to the impact of having an additional boy of the same age. The results are shown in Figures

B.7 to B.9. The point estimates are similar to those in the main regressions, which could be because only 2.7% of the households in the dataset have multiple children of the same age and gender. Hence, I conclude that my findings are robust with respect to the existence of multiple births.

7.2 Quinceañera expenses and permanent/transitory incomes

I also investigate how permanent and transitory income changes the size of quinceañera ceremonies. As mentioned in Section 6, the ceremony expenditures are likely to have been noisily measured. Hence, the interpretation of the results needs caution.

Addressing this question advances our understanding of the determinants of the ceremony size. If the size of quinceañeras depends on available resources, then both permanent and transitory income are plausible determinants of the size of quinceañera ceremonies. On the other hand, if quinceañera expenses depend not on transitory income shocks but on permanent income, this suggests that some factors other than currently available resources can be important determinants of quinceañera ceremony sizes. For instance, if local social norms suggest that a wealthy household will have a large quinceañera, then regardless of the transitory income shocks, the households may spend a substantial amount on the ceremony.

To explore this question, I use proxies for permanent and transitory incomes. As a proxy for permanent income, I use a wealth index based on the housing status of households. In particular, I use the first principal component from a PCA using the following information: (i) the number of rooms in the house; (ii) whether the roof material is concrete; and (iii) whether the wall material is bricks/concrete. McKenzie (2005), using the same ENIGH Mexican data, shows that the wealth inequality measure created based on housing assets, such as roof or wall materials, has a high correlation with the actual wealth inequality.

As a proxy for transitory income, I use rainfall and temperature shocks. In particular, I use the following municipality-level weather measures: (i) annual precipitation; (ii) an index taking the value 1 if annual precipitation is above the 80th percentile and -1 if below the 20th percentile of the long-run (1981-2019) precipitation distribution of the municipality; (iii) annual average temperature; and (iv) an index taking the value 1 if the annual average temperature is above the 80th percentile and -1 if below the 20th percentile of the long-run (1986-2016) annual average temperature of the municipality. Measure (i) is used by Munshi (2003) as a factor that changes migration from the US to Mexico through its influence on agricultural production. Measure (ii) is considered by Shah and Steinberg (2017) as a shock to agricultural production in India. My decision to consider temperature shocks as well as

rainfall is based on the recent findings that heat negatively affects crop growth (Lobell et al., 2013; Schlenker and Roberts, 2009). For details on weather datasets and construction of the measures, see Appendix C. For comparative purposes, both permanent and transitory income proxies are standardized to mean 0 and standard deviation 1 in the analyses below. Hence, the point estimate is interpreted as the change in the difference in the outcome between households with a girl and a boy at the same age when a measure increases by a one standard deviation.

First, I analyze whether ceremony expenses in general, not limited to quinceañera expenses, are correlated with household permanent and transitory income. For this, I run the following regression equation:

$$E_{ijt} = \lambda M_{ijt} + X_{ijt}\gamma + \mu_j + \tau_t + \epsilon_{ijt}, \quad (2)$$

where E_{ijt} is the inverse hyperbolic sine of ceremony expenditures in household i in municipality j in year t . The variable M_{ijt} represents permanent income or transitory income shocks explained above. I control for household characteristics (X_{ijt}) and include municipality and year fixed effects (μ_j and τ_t). Since weather shocks primarily affect agricultural production, I use households in rural areas in the analyses.

The regression results are shown in Table A.3. For permanent income, Column (1) shows a statistically significant and positive correlation between expenditure on the ceremony and the household's wealth index. This means that wealthier households spend more in general on ceremonies.

For transitory income shocks, I first establish whether the weather shock measures are correlated with household income. For this, I run Equation (2) with IHS household income as an outcome and weather shocks as the main right-hand side variables. The results are shown in Table A.4.¹⁴ I find that, whereas household income varies directly with rainfall, the point estimates for temperature shocks are statistically insignificant. This suggests that, in the context of this study, rainfall matters for agricultural production, but temperature does not. Hence, in the discussion below, I will consider rainfall fluctuations as the key proxy for transitory income shocks.

The effects of rainfall shocks on ceremony expenditures are shown in Columns (2) and (3) in Table A.3. They demonstrate statistically insignificant point estimates. That is, the rainfall shocks do not change general ceremony expenses.

¹⁴Since the temperature data are available up to 2016, the observations in 2018 are dropped from the analyses in Columns (3) and (4).

Next, I analyze how household income is related to specifically quinceañera-based expenditures. For this, I run the following regression:

$$\begin{aligned}
E_{ijt} = & \lambda M_{ijt} + \sum_{h=8}^{17} \alpha_h G_{ijt}^h + \sum_{h=8}^{17} \beta_h C_{ijt}^h \\
& + \sum_{h=8}^{17} \eta_h M_{ijt} G_{ijt}^h + \sum_{h=8}^{17} \theta_h M_{ijt} C_{ijt}^h + X_{ijt} \gamma + \mu_j + \tau_t + \epsilon_{ijt}.
\end{aligned} \tag{3}$$

The coefficients of interest are η_h 's. These indicate how the differences in the outcome between households with a girl and a boy of the same age change as permanent or transitory income changes.

Panel A in Figure B.10 shows that, although statistically insignificant, there is an upward jump in the point estimate for the interaction of an indicator for having 15-year-old girls and the wealth index. This is suggestive evidence that permanent income matters as a determinant of the size of quinceañera ceremonies. On the other hand, in Panels C and D, I observe no evidence that households change quinceañera expenditures in response to rainfall shocks.

In summary, whereas I find suggestive evidence that permanent income matters for the size of quinceañera ceremonies, it does not seem to depend on transitory income shocks. Put differently, the ceremony size depends not only on the resources presently available to the households, but also on how large the ceremony is *expected* to be. The origin of this expectation cannot be explored with the data at hand, and exploration of this question is left for future research.

8 Conclusion

Although the literature documents people in developing countries spending significant resources on festivals and ceremonies, there have been few empirical studies of this phenomenon. The endogenous timing of the festivals and ceremonies is one of the factors behind this lack of studies. In this study, I overcome this issue and identify the causal impact of a ceremony, quinceañeras, for Mexican households. I use a unique feature in this ceremony that it is only held by households with a girl turning 15 years old. This allows the use of households with a boy of the same age and households with girls of different ages as control groups.

In particular, I empirically investigate how households afford large expenditures for

quinceañeras and how these expenditures affect their economic outcomes. Answering these questions advances our understandings of how low-income households in developing countries manage large expenditures and what kind of constraints they face in doing so. Furthermore, the analyses of the economic consequences of expensive ceremonies in developing countries fill the gap in the literature mentioned above.

The main findings are as follows. First, households use savings and transfers from other households to fund large expenditures on quinceañeras. Second, the expense of quinceañeras may cause families to temporarily shut down their non-agricultural household businesses. Finally, I do not find any evidence that quinceañeras strengthen social networks among households.

This study has several policy implications. First, my results offer insights into the role of financial institutions in developing countries in helping households deal with large expenditures. The results indicate that saving allows households facing large quinceañera expenditures to smooth their consumption over time. As highlighted in the previous studies, my study demonstrates the value of access to credit for low-income households. Secondly, my findings have implications for aiding small and medium enterprises in response to large economic needs, which in my study are expenditures for quinceañeras. Since self-employment is an invaluable income source for many households in developing countries, preparing safety nets and developing a system to support their businesses suffering from economic difficulties is crucial.

Quinceañeras is a ceremony widely observed in Latin American countries. Hence, the results I find using data in Mexico may have direct implications for other countries in the region. However, this does not mean that the results obtained in this paper can be applied to other ceremonies in other parts of the world. What sets quinceañeras apart is that the timing of the ceremonies is known so far in advance. Other ceremonies such as marriage and funerals have timing determined by various factors such as economic circumstances. Exploring the effect of such events in other settings is an avenue for future research.

There are several limitations to this study. First of all, it fails to identify the reasons why households make large expenditures on quinceañeras. Whilst I do not find that quinceañeras help households strengthen their social ties with neighbors, there are other potential benefits in quinceañeras.¹⁵ For instance, households may spend a lot of resources on quinceañeras for marriage motives. I cannot test this hypothesis in my empirical framework since most girls

¹⁵As discussed in Section 6, my measure of network strength may not capture a quinceañera's actual effect on social networks between households.

and boys get married after turning 15 years of age. This makes it impossible to compare how marriage outcomes are affected by quinceañeras.

Another possibility is that households may purely gain utility from quinceañera expenditures. Interacting with friends and relatives in the quinceañera ceremonies can give joy to households. Also, if parents are altruistic to their daughters, making them happy through quinceañera ceremonies can result in higher utility for themselves. Moreover, as several studies have found, festival and ceremony expenditures may play a role as conspicuous consumption (Bloch et al., 2004; Brown et al., 2011). By showing their wealth and status to neighbors, households may gain utility. However, to justify large expenditures on festivals and ceremonies as documented in previous studies (Banerjee and Duflo, 2007) and in this paper, such utility gains must be sufficiently large. Considering the large expenditures and the whole discussion over poverty traps (Barrett et al., 2018) and unexploited investment opportunities due to credit constraints (Kaboski and Townsend, 2011), this seems unlikely. Identifying the reasons behind large expenditures on festivals and ceremonies in low-income countries is an important research issue.

Another thing that could not be addressed in this study is the importance of the size of ceremonies. While I investigate the effect of having a quinceañera, or more precisely, the impact of having a chance to hold a quinceañera, the effects of a large ceremony and a small ceremony can differ. Since the size of the ceremony is endogenous, exogenous factors that vary the size of a quinceañera are required to answer this question. This is left for future research.

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A Tables

Table A.1: Weights for the principal component analyses on social network strength

	2008	2010	2012	2014	2016	2018
How difficult is it for you to ask for help to get a job?	0.45	0.45	0.45	0.45	0.45	0.45
How difficult is it for you to ask for help to take care of you in an illness?	0.51	0.51	0.50	0.50	0.50	0.51
How difficult is it for you to ask to borrow the amount of money that you usually earn per month?	0.42	0.41	0.41	0.41	0.42	0.42
How difficult is it for you to ask for help to accompany to go to the doctor?	0.49	0.49	0.48	0.49	0.48	0.49
How difficult is it for you to ask for cooperation to improve your neighborhood or community?	0.36	0.36	0.38	0.38	0.37	0.36

Notes: The table shows the weights in the principal component analyses on social network strength. These weights are used to calculate the first principal component.

Table A.2: Weights for the categorical principal component analyses on social network strength

	2008	2010	2012	2014	2016	2018
How difficult is it for you to ask for help to get a job?	0.64	0.65	0.66	0.63	0.65	0.66
How difficult is it for you to ask for help to take care of you in an illness?	0.75	0.75	0.74	0.72	0.74	0.76
How difficult is it for you to ask to borrow the amount of money that you usually earn per month?	0.57	0.58	0.57	0.56	0.57	0.58
How difficult is it for you to ask for help to accompany to go to the doctor?	0.72	0.72	0.71	0.69	0.71	0.72
How difficult is it for you to ask for cooperation to improve your neighborhood or community?	0.50	0.51	0.55	0.52	0.53	0.51

Notes: The table shows the weights in the categorical principal component analyses on social network strength. These weights are used to calculate the first principal component.

Table A.3: Wealth, weather shocks, and ceremony expenditures

	<i>Dependent variable:</i>				
	IHS ceremony expenditures				
	(1)	(2)	(3)	(4)	(5)
Wealth index	0.02*** (0.001)				
Annual total precipitation (mm)		0.0004 (0.005)			
Precipitation shock			0.0005 (0.002)		
Annual average temperature (degree C)				-0.01 (0.02)	
Temperature shock					-0.001 (0.002)
Controls	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	62,848	63,832	63,832	49,835	49,835
R ²	0.04	0.04	0.04	0.05	0.05

Notes: *p<0.1; **p<0.05; ***p<0.01. Only rural households are used in the analyses. The outcome variable is inverse hyperbolic sine of ceremony expenditures. The outcome variable, in 1,000 Mexican Pesos, is converted to real terms (value in 2015). As “Wealth index,” I use the first principal component from a PCA on the housing status of households. The variable “Precipitation shock” takes the value 1 if annual precipitation is above 80 percentile and -1 if below 20 percentile of the long-run (1981-2019) precipitation distribution of the municipality. The variable “Temperature shock” takes the value 1 if annual average temperature is above 80 percentile and -1 if below 20 percentile of the long-run (1986-2016) annual average temperature distribution of the municipality. All the weather shock variables are standardized so that the means are 0 and the standard deviations are 1. Since the temperature data is available up to the year 2016, the observations in 2018 are dropped from the analyses in Columns (4) and (5). Control variables included in the regression are household size and the age of the household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

Table A.4: The effect of weather shocks on household income

	<i>Dependent variable:</i>			
	IHS HH income			
	(1)	(2)	(3)	(4)
Annual total precipitation (mm)	0.04* (0.02)			
Precipitation shock		0.02*** (0.01)		
Annual average temperature (degree C)			-0.08 (0.10)	
Temperature shock				-0.01 (0.01)
Controls	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	63,832	63,832	49,835	49,835
R ²	0.28	0.28	0.29	0.29

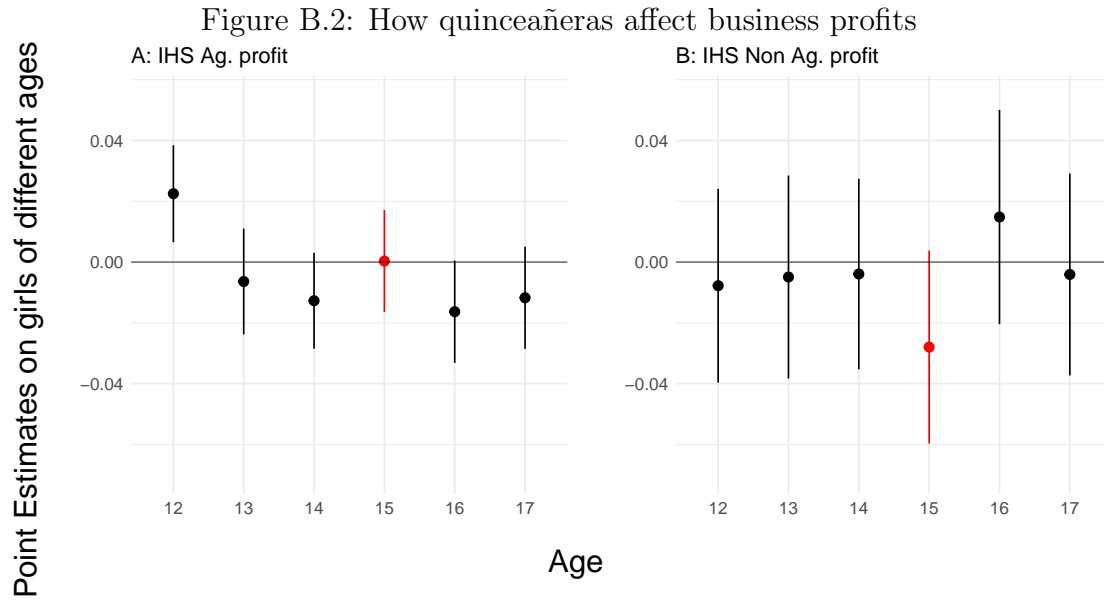
Notes: *p<0.1; **p<0.05; ***p<0.01. Only rural households are used in the analyses. The outcome variable is inverse hyperbolic sine of household income. The outcome variable, in 1,000 Mexican Pesos, is converted to real terms (value in 2015). The variable “Precipitation shock” takes the value 1 if annual precipitation is above 80 percentile and -1 if below 20 percentile of the long-run (1981-2019) precipitation distribution of the municipality. The variable “Temperature shock” takes the value 1 if annual average temperature is above 80 percentile and -1 if below 20 percentile of the long-run (1986-2016) annual average temperature distribution of the municipality. All the weather shock variables are standardized so that the means are 0 and the standard deviations are 1. Since the temperature data is available up to the year 2016, the observations in 2018 are dropped from the analyses in Columns (3) and (4). Control variables included in the regression are household size and the age of the household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

B Figures

Figure B.1: How parents' wage earnings change around the year of quinceañeras

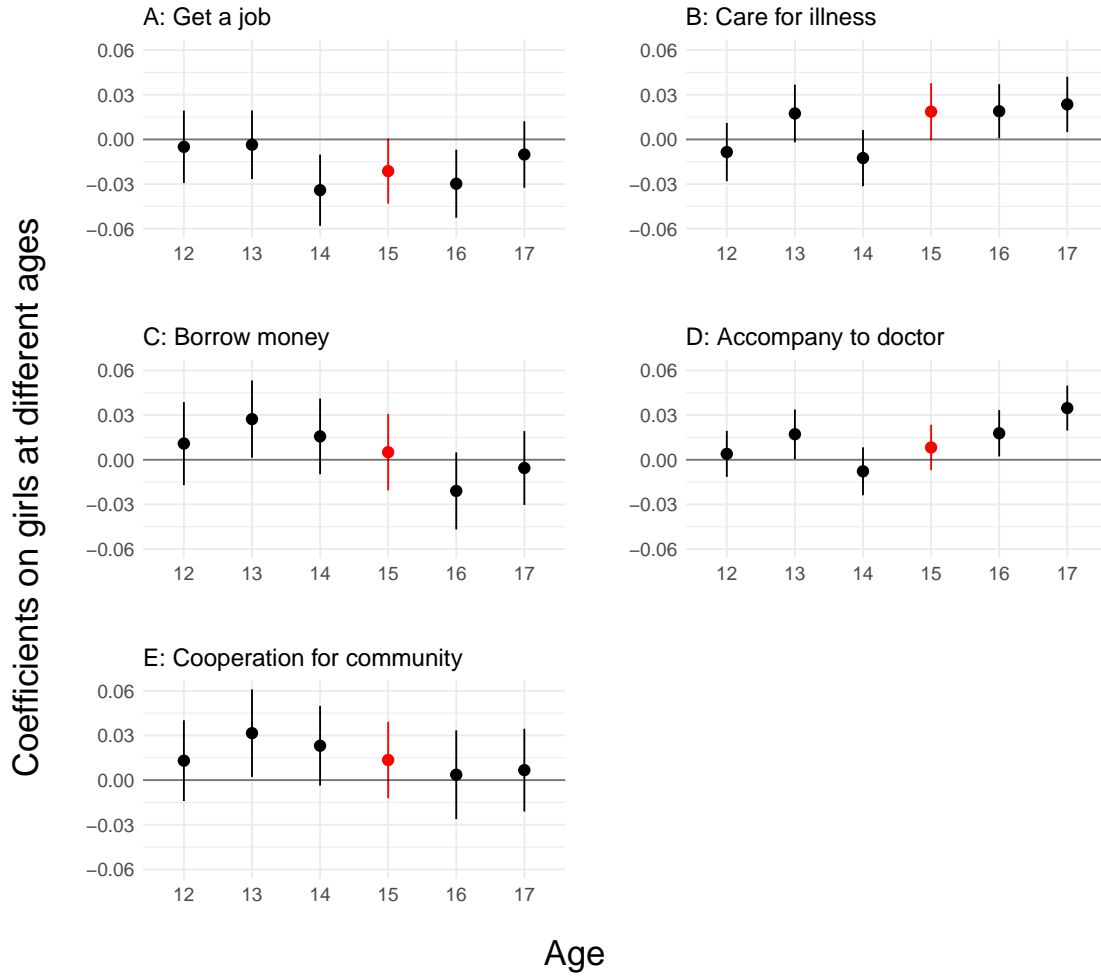


Notes: Points and lines indicate point estimates and 90% confidence intervals. The outcome variables are IHS of fathers' wage earnings (Panel A), and IHS of mothers' wage earnings (Panel B). I use data after 2010 and restrict the analyses to households in which children between 8 to 17 years old have the same father or mother. The outcome variables, in 1,000 Mexican Pesos, are converted to real terms (value in 2015). Control variables included in the regression are household size and the age of the household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.



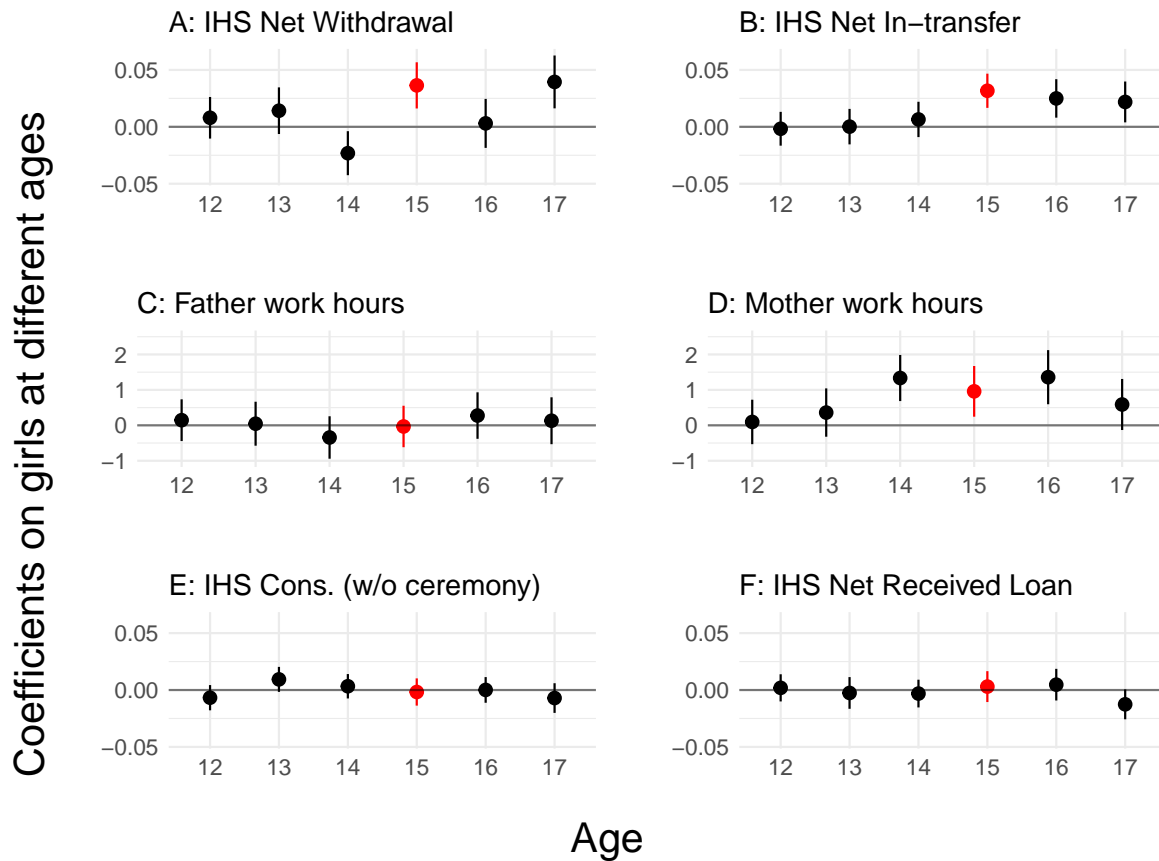
Notes: Black points and lines indicate point estimates and 90% confidence intervals of α_h from equation (1). The outcome variables are IHS of agricultural profits (Panel A), and IHS of non-agricultural profits (Panel B). The outcome variables, in 1,000 Mexican Pesos, are converted to real terms (value in 2015). Control variables included in the regression are household size and the age of household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

Figure B.3: How quinceañeras affect the strength of social networks (individual questions)



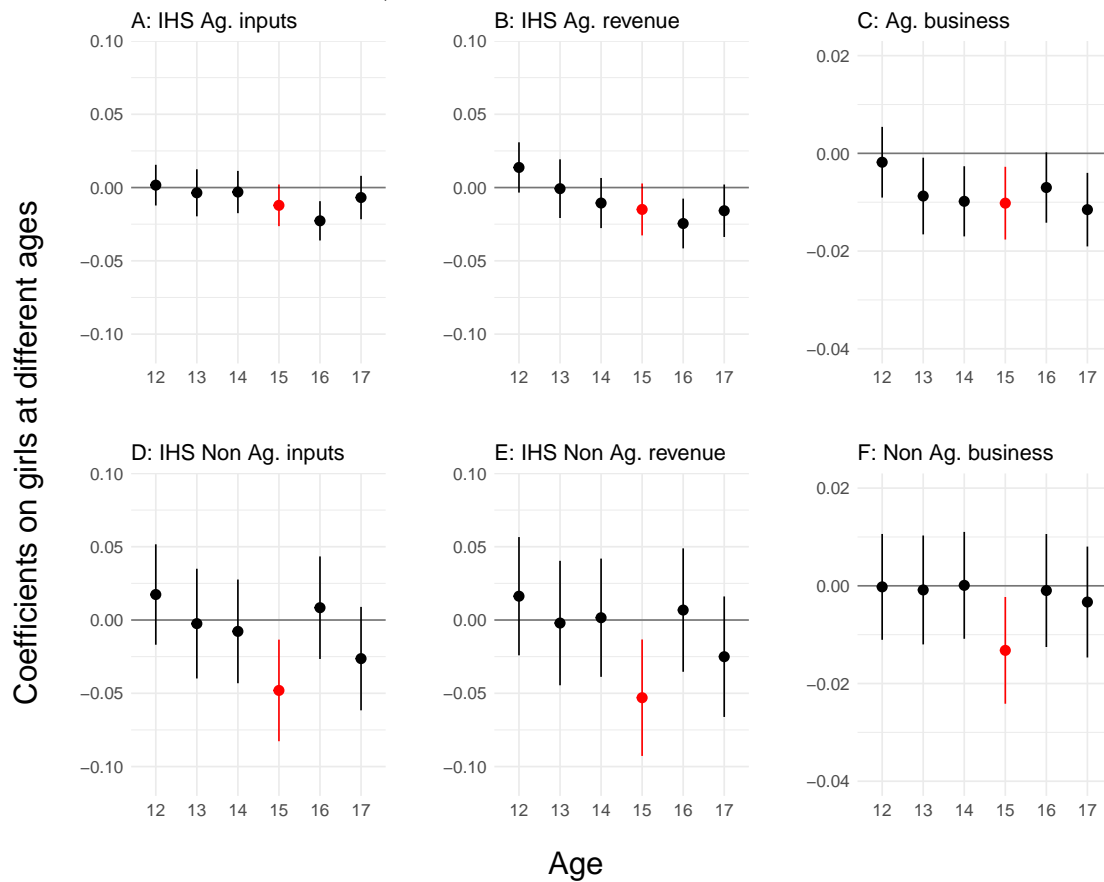
Notes: Black points and lines indicate point estimates and 90% confidence intervals of α_h from equation (1). The outcome variables are the answers to the following questions: “How difficult is it for you to get help to get a job?” (Panel A), “How difficult is it for you to get help to take care of you in an illness?” (Panel B), “How difficult is it for you to borrow the amount of money that you usually earn per month?” (Panel C), “How difficult is it for you to get help to accompany to go to the doctor?” (Panel D), and “How difficult is it for you to get a cooperation to improve your neighborhood or community?” (Panel E). The answers are 1: Impossible, 2: Difficult, 3: Neither difficult nor easy, 4: Easy, and 5: Very easy. Control variables included in the regression are household size and the age of household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

Figure B.4: How households afford quinceañeras (households with at least one 12-17-year-old child are used)



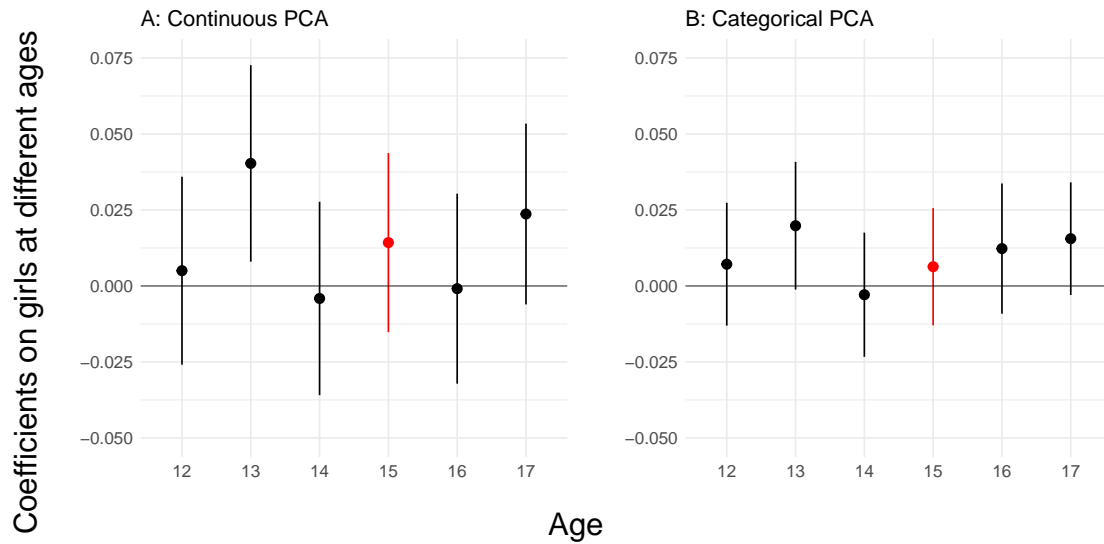
Notes: Points and lines indicate point estimates and 90% confidence intervals. The outcome variables are IHS of net-withdrawals (withdrawals – deposits) (Panel A), IHS of net in-transfers (in-transfers – out-transfers) (Panel B), father’s work hours over the past one week (Panel C), mother’s work hours over the past one week (Panel D), IHS of household consumption excluding ceremony expenditures (Panel E), and IHS of net received loans (received – given) (Panel F). The outcome variables in Panels A, B, C, and D, in 1,000 Mexican Pesos, are converted to real terms (value in 2015). Control variables included in the regression are household size and the age of the household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

Figure B.5: How quinceañeras affect business inputs and outputs (households with at least one 12-17-year-old child are used)



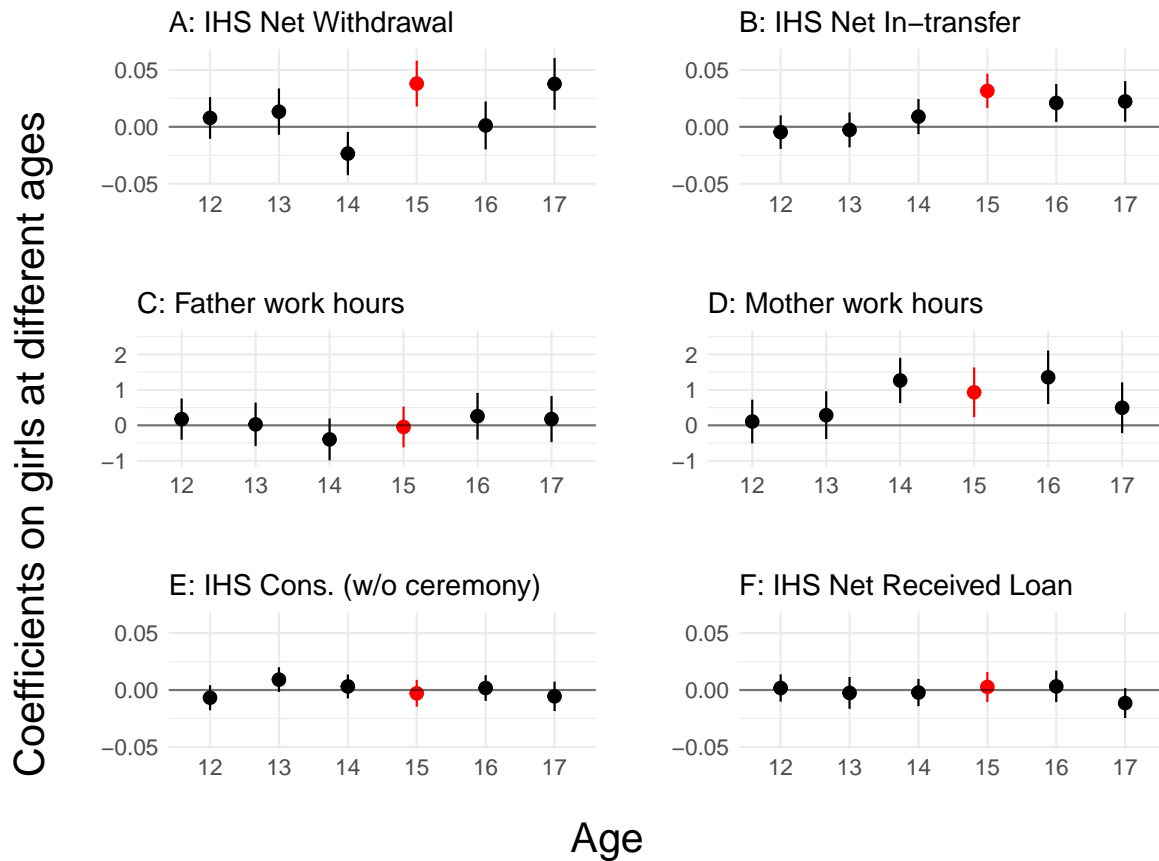
Notes: Points and lines indicate point estimates and 90% confidence intervals. The outcome variables are IHS of agricultural inputs (Panel A), IHS of agricultural revenues (Panel B), an indicator for engaging in agricultural production (Panel C), IHS of non-agricultural inputs (Panel D), IHS of non-agricultural revenues (Panel E), and an indicator for engaging in non-agricultural business (Panel F). The outcome variables in Panels A, B, D, and E, in 1,000 Mexican Pesos, are converted to real terms (value in 2015). Control variables included in the regression are household size and the age of the household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

Figure B.6: How quinceañeras affect strength of social networks (households with at least one 12-17-year-old child are used)



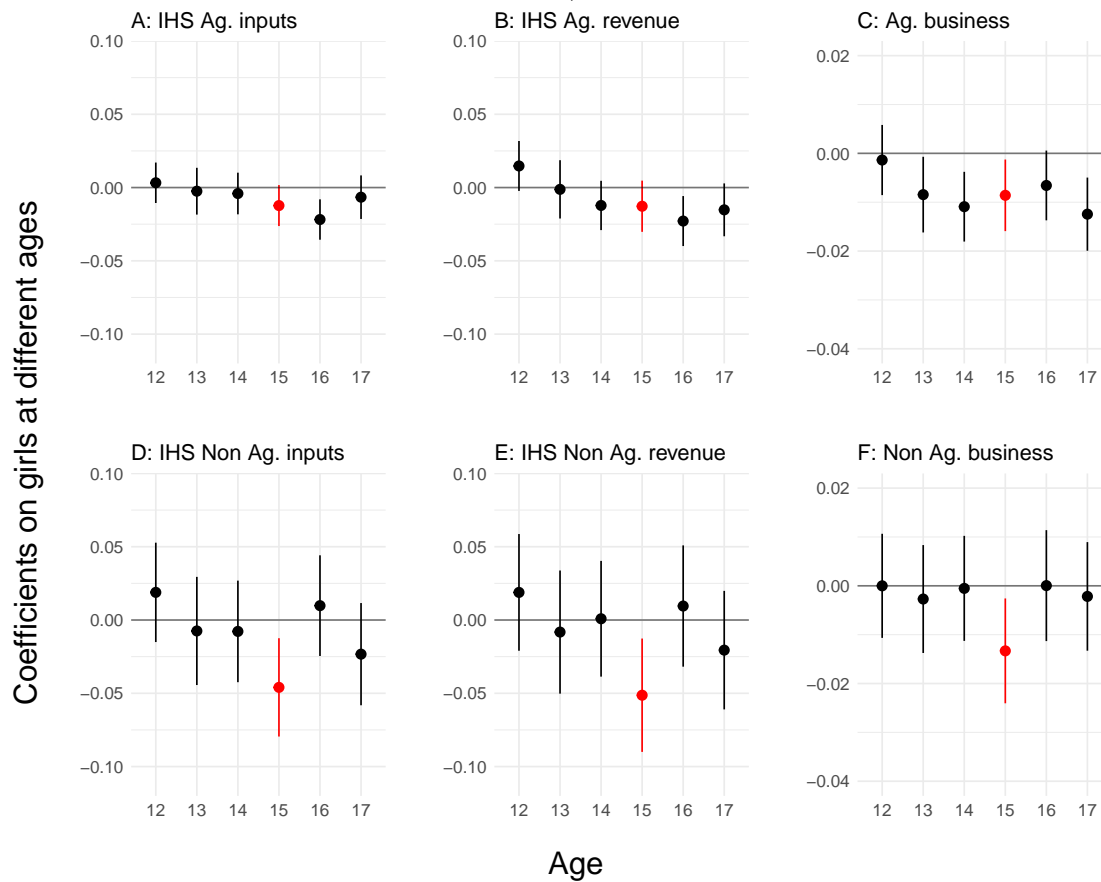
Notes: Points and lines indicate point estimates and 90% confidence intervals. The outcome variables are the first principal component from a PCA considering the answers to network questions are continuous (Panel A), and the first principal component from a PCA considering the answers to network questions are categorical (Panel B). Control variables included in the regression are household size and the age of the household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

Figure B.7: How households afford quinceañeras (the numbers of children, not an indicator for having any child, are used)



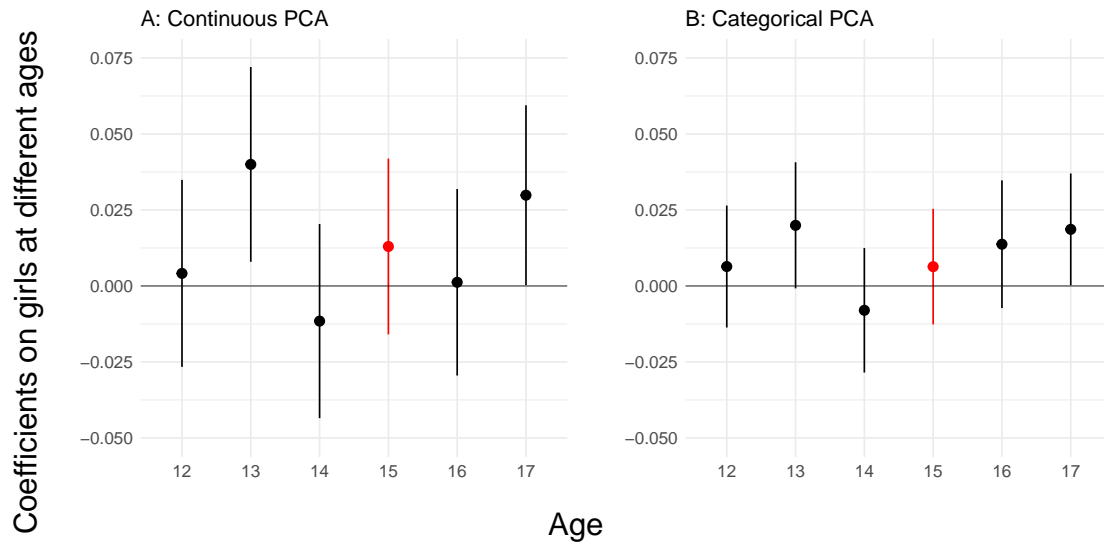
Notes: Points and lines indicate point estimates and 90% confidence intervals. The outcome variables are IHS of net-withdrawals (withdrawals – deposits) (Panel A), IHS of net in-transfers (in-transfers – out-transfers) (Panel B), father’s work hours over the past one week (Panel C), mother’s work hours over the past one week (Panel D), IHS of household consumption excluding ceremony expenditures (Panel E), and IHS of net received loans (received – given) (Panel F). The outcome variables in Panels A, B, C, and D, in 1,000 Mexican Pesos, are converted to real terms (value in 2015). Control variables included in the regression are household size and the age of the household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

Figure B.8: How quinceañeras affect business inputs and outputs (the numbers of children, not an indicator for having any child, are used)



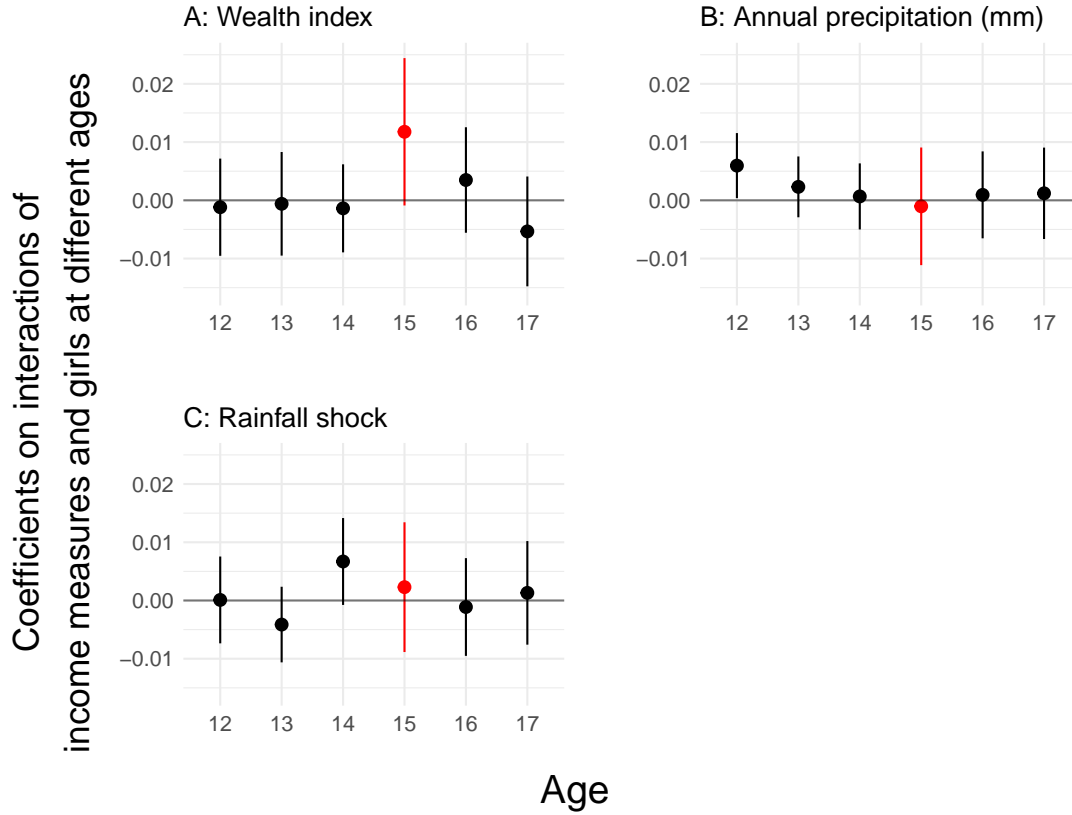
Notes: Points and lines indicate point estimates and 90% confidence intervals. The outcome variables are IHS of agricultural inputs (Panel A), IHS of agricultural revenues (Panel B), an indicator for engaging in agricultural production (Panel C), IHS of non-agricultural inputs (Panel D), IHS of non-agricultural revenues (Panel E), and an indicator for engaging in non-agricultural business (Panel F). The outcome variables in Panels A, B, D, and E, in 1,000 Mexican Pesos, are converted to real terms (value in 2015). Control variables included in the regression are household size and the age of the household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

Figure B.9: How quinceañeras affect strength of social networks (the numbers of children, not an indicator for having any child, are used)



Notes: Points and lines indicate point estimates and 90% confidence intervals. The outcome variables are the first principal component from a PCA considering the answers to network questions are continuous (Panel A), and the first principal component from a PCA considering the answers to network questions are categorical (Panel B). Control variables included in the regression are household size and the age of the household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

Figure B.10: How do expenditures on quinceañera change in response to the change in permanent and transitory incomes?



Notes: Points and lines indicate point estimates and 90% confidence intervals. Only rural households are used in the analyses. The outcome variables in all panels are IHS of ceremony expenditures. The titles of each panel indicate the proxies for permanent or transitory incomes. These variables are standardized so that the means are 0 and the standard deviations are 1. The point estimates are interpreted as the change in the difference in the outcome between households with a girl and a boy at the same age when the variables increase by a one standard deviation. As “Wealth index,” I use the first principal component from a PCA on the housing status of households. The variable “Precipitation shock” takes the value 1 if annual precipitation is above 80 percentile and -1 if below 20 percentile of the long-run (1981-2019) precipitation distribution of the municipality. The ceremony expenditures and the household income, in 1,000 Mexican Pesos, are converted to real terms (value in 2015). Control variables included in the regression are household size and the age of the household head. Municipality fixed effects and year fixed effects are included in the regression as well. Standard errors are clustered at the municipality level.

C Construction of weather-related variables

In Section 7, I use weather shocks as proxies of transitory income shocks. As weather shocks, I consider the following municipality-level measures: (i) annual precipitation; (ii) an index taking a value 1 if annual precipitation is above 80 percentile and -1 if below

20 percentile of the long-run (1981-2019) precipitation distribution of the municipality; (iii) annual average temperature; and (iv) an index taking a value 1 if annual average temperature is above 80 percentile and -1 if below 20 percentile of the long-run (1986-2016) annual average temperature of the municipality. In this section, I explain the data sources and construction of these measures.

For precipitation measures, (i) and (ii), I use Climate Hazards Group InfraRed Precipitation with Station (CHIRPS) data. Incorporating satellite information and weather station data, the data provides high-resolution (0.05×0.05 degrees) information on weather data in various temporal resolutions such as daily, monthly, or daily. Construction of my rainfall measures uses the annual average precipitation information. For details on the dataset, see [Funk et al. \(2015\)](#).

For temperature measures, (iii) and (iv), the information in the Climate Hazards Center Infrared Temperature with Stations (CHIRTS) data is used. For the construction of the measures, I use CHIRTS-Daily, which contains daily maximum and minimum temperatures. I use their average as daily average temperature, and by taking the average of the daily means, I calculate the average annual temperature in a municipality. Refer to [Funk et al. \(2019\)](#) for details on the dataset.

To combine these weather datasets with ENIGH and obtain municipality-level weather variables, we use weather measures at four grid points surrounding municipality centroids. Then, I take the average of them, weighted by the inverse distance between the centroids and each of the four grid points. For annual precipitation and annual average temperature, I directly use the measures created in the process described above. For the rainfall shock measure (ii), following [Shah and Steinberg \(2017\)](#), I create a variable taking the value 1 if the annual precipitation is above 80 percentile and -1 if below 20 percentile of the long-run (1981-2019) precipitation distribution of the municipality. The temperature shock measure (iv) is created similarly.