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ABSTRACT

Family Ceremonies as a Constraint on Informal Sector Investment: The Case of Sénégal*

We analyze how intermittent large expenditures on family ceremonies may affect an entrepreneur's investment decision in an informal enterprise. Our hypothesis is that the barrier between family and enterprise is thin and permeable. We test this hypothesis using a survey from Sénégal that combines informal sector and household data. We estimate a measure of exposure to spending on births, weddings and funerals, and show this has a significant negative relationship with the decision to invest and the amount of investment. These results are robust to changes in specifications of the determinants of investment, controlling for both enterprise- and family-related variables.

JEL Classification: O17, D13, O12

Keywords: informality, investment behaviour, family ceremonies

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1 Introduction

Micro and small enterprises in developing economies face serious obstacles to growth, and in many countries, including much of Sub-Saharan Africa, a missing middle has been observed in the size distribution of enterprises (Nichter and Goldmark, 2009; Fox and Sohnesen, 2012; Gelb, Meyer and Ramachandran, 2014).[1] Yet there is evidence of a high real rate of return to capital for some small, and even micro, enterprises. For a Mexican sample with capital stocks of less than $200, McKenzie and Woodruff (2006) estimate that the monthly real rate of return to capital is about 15%, and de Mel et al. (2008) obtain similar results for Sri Lanka. Across seven West African Francophone capital cities, Grimm et al. (2011) find a monthly real rate of return of 4.6-5.3% for informal enterprises that have a mean employment size of 1.6 persons.

In this paper, using data from Sénégal, we argue that family-related expenses can be a significant constraint on investment by an entrepreneur.[2] Our hypothesis is that, for micro and small enterprises, the barrier between the family and business activities is thin and permeable. Investment depends not just on factors related to profitability, but also on the financial circumstances of the entrepreneur's household. We focus on weddings, funerals and birth ceremonies because they involve irregular expenditures that are large relative to family income and have a strong social impact because of their visibility. The obligation to cover such expenditures in the extended family has been stressed for many countries (see below). In Sénégal, funerals, for example, are regarded as important social and religious occasions that reflect the social standing of the deceased and their family (Evans et al., 2016). As is common in Sub-Saharan Africa, micro and small enterprises in Sénégal have little access to formal credit and other financial services (Demigürç-Kunt and Klapper, 2012; Dupas and Robinson, 2013; Zottel et al., 2016).[3,4] Retained profit and family finance remain the principal sources of

[1] The standard view of the missing middle is that the size distribution of enterprises is bimodal, with very few of middle-size. However, using data from India, Indonesia and Mexico, Hsieh and Olken (2014) argue that both middle- and large-size enterprises are missing.

[2] We use the terms 'family' and 'household' interchangeably. Much of the literature refers to the family or 'extended family'. Our analysis is based on surveys that define household membership as those living under the same roof or who consider the surveyed house their main home.

[3] Harrison, Lin and Xu (2014) find that, along with lack of infrastructure and of political competition, access to finance is one of the three key factors that explain poor African economic performance since 1970. Their analysis covers access to informal finance, measured in terms of trade credit, as well as formal finance.

[4] Although the microfinance sector has been growing fast and is quite vibrant in West and Central Africa, including Sénégal, helping small enterprises with access to small loans that may cover depreciation and working capital, strict financial regulation has constrained the amount and the terms of credit typically granted, so that capital accumulation and new technology adoption

investment funds (IMF, 2001; Fox and Sohnesen, 2012). However, an entrepreneur may be the family member who is in the best position to cover its financial needs, allocating funds to ceremonies that might have been used for investment.[5] Thus, it is argued by the Republic of Sénégal (2006) that numerous family and religious festivals and 'ostentatious' family ceremonies undermine the possibilities for investment and growth.

We test our hypothesis using data on micro and small informal enterprises from Dakar and surrounding areas.[6] Our data source, 'Enquêtes 1-2-3', is a three-phase survey carried out by the government of Sénégal in 2002-3 (Republic of Sénégal, 2004). This survey is rich in detail, and allows a link to be made between household characteristics and decisions taken at the household level on the one hand, and informal production activities on the other.[7] The first phase includes a household consumption survey and also gives information on the characteristics of household members, their occupational choices, and the socioeconomic conditions of households. The second phase gives a detailed picture of 1015 informal enterprises. The third phase relates to household consumption and other expenditures, and gives information on spending on family-related events. To the best of our knowledge, the 1-2-3 surveys are the only surveys that combine a living standard household survey with a survey on investment by an entrepreneur from the family. Although the dataset is not recent, we believe it still provides useful insights for countries such as those in West Africa, where social pressure to spend on family ceremonies is strong.

We develop a two-stage econometric methodology. We begin by using the information on spending from the third phase of the survey to estimate Logit regressions for how expenditure on family ceremonies is related to household characteristics

are not generally financed (see, e.g., Aggarwal et al., 2012).

[5] There is little access to safety nets and social protection in Senegal (World Bank et al., 2006; Republic of Senegal, 2006; Leite, Stoeffler and Kryeziu, 2015).

[6] For the survey, informal enterprises are defined as production units that either do not have formal written accounts or are not registered with the tax authorities (or both). Since the tax reform in the late 90s, informal enterprises have had the duty to register with the tax authorities and are authorized to pay only a modest lump sum annual tax without submitting written accounting and financial reports, as long as they declare an annual income under the legal threshold. The large majority of informal production units and retailers in and around Dakar effectively do so. All enterprises in our sample report being registered as informal, whether under the threshold or not. For a detailed analysis of the informal sector in Francophone West African capitals, including Dakar, see Benjamin and Mbaye (2012).

[7] According to the latest government estimates (Republic of Sénégal, 2013), more than 2.2 million Sénégalese (almost half the economically active population) work in the non-agricultural informal sector. The sector produced 4.3b CFA francs of goods and services that year, and contributed 42% of GDP (and 58% of the country nonagricultural value added). Medina et al. (2017) anticipate that the informal sector will continue to account for 40-50% of Sénégal's GDP decades to come.

in the first phase. Specifically, we estimate the probability that a household experiences at least one wedding, funeral or birth ceremony in a year, given its demographic and socioeconomic characteristics.[8] We refer to this probability as the household's 'exposure' to spending on these ceremonies. We then test how the investment behaviour of each entrepreneur represented in the second phase is related to its exposure, controlling for some other variables reflecting family circumstances, as well as on enterprise-related factors.

We begin our analysis of investment with OLS regressions over the whole sample, with results that suggest that exposure to ceremony expenditure may indeed have a significant impact. However, only about 30% of enterprises in the sample made an investment during the period. To account for the zero-inflated distribution of the investment data, we test and estimate the determinants of investment using Tobit regressions and two-part models. The latter enable us to separate out the factors affecting the decision to invest from those affecting the amount of investment. To accommodate the data available, we use total gross investment as our dependent variable. To account for noise, we use alternative specifications of the 'zero investment' threshold.

In each of these specifications, for each model tested, and for both the decision to invest and the amount of investment, we find a highly significant negative impact on investment of the exposure to ceremony expenditure, consistent with our basic hypothesis. We include two other variables related to family circumstances - family income and the number of unemployed workers in the household. We find that family income has little effect on the decision to invest at a very low level, but for the decision to invest a larger amount, and for the amount of investment, it has a positive effect. The effect of having more unemployed workers in the household on the decision to invest changes sign from negative to positive as the investment threshold is raised, while the effect on the amount of investment is consistently positive and highly significant. This suggests that everyday expenses associated with supporting the unemployed in a household may take priority unless there is a sufficiently good profit opportunity requiring a higher level of investment, in which case the unemployed may then be seen as a useful resource for the entrepreneur.

In these regressions we control for more directly enterprise-related factors by including three variables - enterprise age, capital and labour. Our results for the exposure of the household to exceptional family-related events and to having more unemployed members of the household are little affected by inclusion of these variables. However, the inclusion of the enterprise labour variable is associated with family income becoming insignificant for the decision to invest. We argue that enterprise labour dominates family income in this respect as it can be easily varied

[8] Our data do not allow direct control for other types of financial shocks and stresses, such as those related to health.

to affect market conditions and so may be seen as a proxy for profit prospects.

In the literature on poverty traps there is an ongoing debate about the extent to which rural households smooth consumption or smooth asset stocks in the face of uninsured fluctuations in income streams (see, e.g., Carter and Lybbert, 2012). To our knowledge, however, our paper is the first to show econometrically the potential negative effect of family circumstances on physical investment by informal enterprises. An early recognition of this problem is given by Lewis (1955), who notes that successful members of a family may be 'besieged' by distant relatives, with adverse incentive effects. Also, Nafziger (1969) suggests that in small manufacturing enterprises in Nigeria, as the income of an entrepreneur rises, the number of dependents he or she is required to support increases, and this curtails the use of profits for enterprise expansion. More recently, Baland et al. (2011) have presented evidence that better-off households in Cameroon take out costly loans, despite already having larger amounts of savings. One of the authors' interpretations is that the households may use these loans as a commitment device to signal that they are too poor to give others financial help. Also, Squires (2017) has combined evidence from a laboratory experiment with data from Kenya to show how 'kinship taxation' can reduce total factor productivity in micro-enterprises.

The role that kinship may have as a poverty trap in the modern sector is analyzed by Hoff and Singh (2005) and Hoff and Sen (2006), while Azariadis and Stachursky (2005) provide a theoretical overview. More recently, and complementary to our analysis, Gulyani and Talukdar (2010) show that in Nairobi's slums the creation and success of informal household enterprises is affected by household access to electricity, piped water and drainage. Moreover, McKenzie and Paffhausen (2017) analyze a large sample of small enterprises across 12 developing economies and relate the death of enterprises to a number of factors, including illness and other family circumstances.

The literature on informal risk sharing in village economies also emphasizes family links. Collier and Gunning (1999) suggest that such risk sharing in Africa may have a negative effect on production incentives, while, using South African data, Di Falco and Bulte (2011) find that 'forced redistribution' because of kinship obligations can come at the price of a household's consumption and savings. Also, in a laboratory experiment, Jakiela and Ozier (2016) find that women in rural Kenya are willing to conceal their initial endowment to have it available for investment, even though this strategy reduces their expected earnings. However, Angelucci, Di Giorgi and Rasul (2015) find evidence that within extended families in rural Mexico risk sharing in the presence of large resource shocks can support investment in children's human capital.

The obligation to cover expenditures on ceremonies in the extended family is stressed by various researchers. Case, Garrib, Menedez and Ogliati (2013) note

that, in many societies, funerals are an important institution that, amongst other things, knits together the fabric of extended families. In their South African sample, nearly one-quarter of all deaths result in borrowing to pay for the funeral, and poor households that borrow from money lenders to pay for a funeral may find themselves paying back many multiples over several years. Households that cut corners on funerals suffer social disapproval. Case and Menendez (2011) find that expenditure on funerals reduces investments in children, in the sense that it reduces the probability of school enrolment. Banerjee and Duflo (2007) find that in India, households living on less than $1 a day spend on average 14% of their annual income on festivals, including weddings, while Bloch, Rao and Desai (2004) emphasize the conspicuous-consumption aspect of weddings.

The plan of the paper is as follows. In Section 2 we describe our dataset and our methodology. Section 3 presents the Logit regressions from which we derive our measure of family financial exposure. Section 4 then analyses investment using a range of specifications aimed at accounting for the zero-inflated distribution of investment data. Section 5 concludes.

2 Data and Methodology

The Enquêtes 1-2-3 survey provides detailed information on households, their demographic characteristics, living conditions, income, expenditure, and their informal activities in Dakar and surrounding areas (Pikine, Guediawaye and the urban areas of Rufisque).[9] A household is defined as all those living under the same roof.

The dataset is composed of three surveys undertaken in 2002-3. Each survey is weighted for representativeness. Phase 1 took place in the second half of 2002. It covers the total sample of 2,479 households (19,092 individuals). It focuses on the occupation and demographic characteristics of all household members, together with details about their livelihoods. 14,871 individuals in the sample are over 10 years old.

Phase 2, which took place between April and June, 2003, is a survey of 1,015 informal enterprises, chosen randomly from all the enterprises owned by households in the Phase-1 sample.[10] It explores the informal productive activities of this set of enterprises and provides accounting and financial reports.

Phase 3 is a Household Living Standard survey commissioned by the World Bank, conducted on 1,014 households. 516 households from the Phase 1-survey were interviewed between January and May 2003. This phase aimed to trace all household consumption and expenditure over the survey period, including spend-

[9] All tables presented in this paper are based on authors' calculations using Enquêtes 1-2-3.

[10] Although some households might have operated more than one enterprise, at most one enterprise was selected for each household.

ing on weddings, funerals and birth ceremonies. 250 of the households in the Phase-3 survey were also covered in the Phase-2 survey, while 773 were not.

Table 1 provides some basic summary statistics for households in Phase 1. Household size ranges from 1 to 39, with a mean of 7.50, with the numbers in the different age ranges as shown. The table also shows the number of unemployed household members aged 10 and above. These members declared themselves as physically available for work, but not working over the past 30 days.[11] The last row in the table, family income, is defined in the survey as an annualized figure that includes total declared income for every member of the family, including the entrepreneur, inclusive of all non-invested redistributed profit and wages. There is very wide variation, with some households declaring no income, a maximum of 33m CFA francs, and a mean of 1.580m CFA francs. This corresponds to a maximum of about 47,000 euros at the time of the survey, with a mean of about 2,200 euros.

	obs	**mean**	**min**	**max**	**st dev**
adults (aged ≥ 16)	2,479	4.69	1	22	3.15
aged over 60	2,479	0.29	0	3	0.51
children aged ≤ 3	2,479	0.57	0	6	0.82
children aged > 3, < 16	2,479	2.23	0	16	2.15
family size	2,479	7.50	1	39	4.83
unemployed (aged > 10)	2,479	0.49	0	7	0.87
family income (million CFA francs)	2,479	1.58	0	33	2.09

Table 1 Summary Statistics for All Households

Summary statistics for the enterprises in Phase 2 are given in Table 2, where the monetary values are annualized figures. Enterprise age is the number of years that the entrepreneur estimates the enterprise to have operated up to the beginning of the year of the Phase-2 survey (2003). Employment is given by the number of workers at the beginning of the year, including the entrepreneur. Because of data limitations this includes both part-time and full-time workers.

The survey does not provide data for the capital stock at the beginning of the period, but it does give data for the capital stock at the end of the period and for investment during the period. To estimate the initial capital stock we first subtract investment, I_1, made over the period, from value of the capital stock reported in the survey for the end of the period, K_1. Assuming a rate of depreciation d, the initial capital stock K_0 is then calculated as $K_0 = (K_1 - I_1) / (1 - d)$. In Table 2 and in our econometrics we assume $d = 0.10$, but the only impact of a variation in

[11] Specifically, each of these individuals did not classify themselves as being disabled, at school, retired or being a housewife.

$d \in [0, 1)$ would be a rescaling of the capital stock coefficient.[12] The end-of-period capital stock is calculated as the sum of the present replacement values for all equipment, as evaluated by the entrepreneur.

Profit is calculated by subtracting from total revenue declared in the survey all declared operational costs, including wages, other input costs, taxes and rent. No negative profit figures are reported. This may be because wages payments are reduced to cover a loss, or in some cases because the enterprises that make a loss go out of business and so are not in the sample. It could also be because of borrowing and late payment by enterprises. However, as the profit figure is only for one month (and then annualized), it may not be a reliable indication for a longer period. Given this data limitation, we do not use profit in our regressions.

The investment figures are gross, calculated by adding all investment declared by the entrepreneur in the Phase-2 survey in goods, materials and machines over the activity period. The dataset does not allow us to separate out net investment. However, our hypothesis about the effect of family circumstances would apply to gross as well as to net investment.

A large mass of the enterprises in the dataset, 70% of the total, did not report any investment over the surveyed period.[13] Since our econometrics accounts for differences between enterprises that did invest and those that did not, we divide Table 2 into the statistics for these two groups. Summary statistics for the two sets of enterprises taken together are given in Table A2 in the appendix, along with the corresponding data for enterprises with investment thresholds of 5,000 and 10,000 francs CFA (which we use in our regressions below).

[12] Devarajan, Easterly and Pack (2001) use $d = 0.03$ and $d = 0.05$ in their calculations, but Bu (2006) finds $d > 0.7$ for 80% of firms in Zimbabwe.

[13] There is a substantial literature on the investment behaviour of enterprises in Sub-Saharan Africa, but it mostly relates to formal enterprises (for a survey, see Bigsten and Soderbom, 2006). Nonetheless, as in our sample, it is typically found that the majority of these enterprises do not invest in a given year (Bigsten et al., 2005; Shiferaw, 2006).

	obs	mean	min	max	st dev
enterprises with investment = 0					
age (years)	648	9.50	0	48	8.68
labour	650	1.59	1	11	1.42
capital stock (CFA francs 000)	652	230.72	0	16389	1040.43
profit (CFA francs 0000)	618	112.85	0	3900	235.72
enterprises with investment > 0					
age (years)	358	9.39	0	63	9.47
labour	361	1.85	1	11	1.53
capital stock (CFA francs 000)	362	115. 60	0	2998	360.81
profit (CFA francs 0000)	350	140.82	1.2	2172	265.89
investment (CFA francs 000)	362	67.62	0	2561	272.03

Table 2 Summary Statistics for All Enterprises

The dataset covers a wide range of enterprise age. The average age for both sets of enterprises in Table 2 is over 9 years, but there are significant numbers of new enterprises and of relatively old ones. Of the 1006 enterprises for which age is given in the dataset, 81 were up to one year old and 113 more than 20 years old. The dataset contains mostly micro enterprises, with a mean employment, including the entrepreneur, of between 1.59 for those that did not invest and 1.85 for those that did invest. (In the whole set of enterprises, 281, out of the 1011 for which employment figures were given, had no employees apart from the entrepreneur). However, the largest employed 11. Enterprises that did not invest had a mean capital stock that was almost twice as large as that for enterprises that did invest. 27.2% of firms had a capital stock with value below 10,000 CFA francs. Mean profit was slightly higher for the set of investing enterprises, but, as explained above, the profit figures should be treated with caution.[14]

The sectoral classification of the enterprises in the sample is shown in Table A1 in the appendix. Nearly 39% of the sample are engaged in transport, and nearly 25% in wood and metal work. 42% of entrepreneurs in the sample are women.

The Phase-3 survey shows that household budgets can be affected particularly severely by spending on family-related special occasions. In Sénégal, as in much of Sub-Saharan Africa, these events are traditionally associated with expenditures that, although not frequent, can be substantial when they do occur. Table 3 shows the average expenditure for those households who incur these over the period of the survey. Because some spending for a given event may be split across periods,

[14] We removed one outlier from the empirical analysis. While the enterprise had no employees apart from the entrepreneur, and no capital stock, the investment reported was 10 times higher than the maximum investment of the other enterprises in the sample. We assume it was a reporting error.

these figures may underestimate the amount spent.[15]

CFA francs (000s)	**obs**	**mean**	**st dev**	**min**	**max**	**prob**
Wedding	2,479	171.0	301.7	1.5	1,100.0	0.048
Funeral	2,479	109.8	189.3	0.6	750.0	0.069
Birth ceremony	2,479	177.0	332.7	1.0	2,500.0	0.200
All	2,479	195.7	323.8	1.5	2,500.0	0.240

Table 3 Expenditure on Family Ceremonies

The average annual expenditure on these events per household was 195,700 CFA francs. Data from the Phase-3 survey show that this was 53.9% of a household member's average annual consumption. The probability column shows the proportion of households in the sample incurring each of these expenditures. The probability in the last row shows that 24% of households incurred at least one such expenditure.

The Phase-1 survey provides detailed information on household composition and living circumstances ('household circumstances' for short) for the entire sample. However, the surveys in Phase 2 (on informal enterprises) and Phase 3 (on household living standards) were completed on different subsets of the households surveyed in Phase 1. The size of the intersection of these subsets invalidates its use as a representative subset, even though the 250 households it contains were randomly selected. We nonetheless develop a methodology that allows us to link the behaviour of the entrepreneur to household circumstances.

The Phase-3 survey includes data on expenditures on weddings, funerals and births. This allows us, in an initial stage of our econometrics, to infer the relationship of each of these three types of exceptional expenditure to household circumstances in this sample. To avoid multicollinearity, we do not use three separate indicators - for weddings, funerals and births - of exceptional expenditure. Instead, we use one indicator, which is defined as the probability that a household will make at least one of these expenditures, given its characteristics with respect to age, health and marital status of each of its members, family income and living conditions.[16]

In a second stage we use the Phase-2 survey of informal enterprises to link investment with the entrepreneur's household circumstances, though this is for a different subset of households to those in Phase 3. Given the estimates made from the Phase-3 survey regarding the relationship between household circumstances

[15] In particular, the figures in the minimum column do not indicate realistic costs even for the cheapest ceremonies.

[16] Our qualitative results also hold if we use the probability of one type event (e.g., of a funeral) in the regressions. However, if we include separately the probabilities of two or three types of event, multicollinearity issues arise.

and the probability of an exceptional expenditure, we then infer the probability of an exceptional expenditure in the household of each entrepreneur in Phase 2. In addition to this probability, we represent family circumstances by family income and the number of unemployed household members.[17]

The Phase-2 survey also provides information on various enterprise-related variables, of which we include enterprise age, employment and the initial capital stock in our regressions. Nonetheless, the distinction between family- and enterprise-related variables is not clear-cut. For example, family income has a strong 'enterprise' aspect in that it includes profit and wages from the enterprise, while employment has a strong 'family' aspect in that it covers household members as well as outsiders.

It is worth reiterating the timing of the observations in the dataset. In Phase 1 household circumstances are observed in the last 6 months of 2002. In Phase 3 the observations for expenditures on funerals, births and weddings are then made in months 1-5 of 2003. In Phase 2 the observations for investment, enterprise age and employment are made in months 4-7 of 2003. Thus, our dependent variable, investment, is concurrent with the exceptional expenditure variable for two months, and then covers a subsequent two-month period.

The effect of the financial exposure variable in our results can be interpreted in two different ways - as relating to a shortage of finance or to the precautionary motive. In a household that has suffered at least one of the three exceptional expenditures, the drain on its finances may have had a negative effect on its investment. Averaging over all households, those that did and those that did not incur the expenditure, a negative effect on investment would thus be expected. However, depending on the specific characteristics of a household, the anticipation of a potential exceptional expenditure might have caused an entrepreneur to hold back investment, at least partly, for precautionary reasons. We cannot distinguish the extent to which the data reflect each of these interpretations. The partial concurrence of the investment and exceptional expenditure observations suggests that the two motivations for restraining investment may be mixed in the data.

3 Exposure to Family Ceremony Expenditure

We estimate the probability that a household in Phase 1 will face an exceptional expenditure on one of our three family events. Denoting the three events as F (funeral), B (birth) and W (wedding), our measure of the household's financial

[17] In our econometrics, we use family income rather than consumption as an indicator of financial resources because consumption is only estimated for the Phase-3 sample, so that there is only a partial overlap with the Phase-2 sample.

exposure E to these events is thus given by

$$\begin{aligned} E &= Prob(F \cup B \cup W) = Prob(F) + Prob(B) + Prob(W) \\ &\quad -Prob(F \cap B) - Prob(F \cap W) - Prob(B \cap W) + Prob(F \cap B \cap W). \end{aligned}$$

We estimate E using Logit regressions where the dependent variables are the age and marital status of the household's members, living conditions (proxied by the type of accommodation and access to electricity) and the socio-professional category of the head of household, as well as family income. When testing for the impact of the socio-professional category of the head of households, we use 'independent' as the reference (or excluded dummy). Similarly we use single men as the reference category when estimating the determinants of the probability of a birth and a wedding. In each case the results that we report in this section are for the best fit model according to log likelihood.

The results for the probability of a funeral are shown in Table A3, where all the variables and modalities are significant at the 1% level. As we might expect, there is a positive relationship between the probability of a funeral and the number of adults aged 45-55 and above 55, the number of children under 1 year old, and the number of individuals suffering from serious chronic illness and disabilities. There is also a positive relationship with the number of widows, presumably because of the correlation of age with widowhood. However, the negative relationship with the number of children aged between 1 and 3 is less intuitive. This might be because the presence of young children indicates that the parents, who are relatively young, are also members of the household, or it might be correlated with the general health of the household.

We proxy living conditions through the type of accommodation and access to electricity. The probability of a funeral is found to be negatively related to family income and whether there is domestic access to electricity. It is also related to the type of accommodation, negatively if the household occupies a flat (more than one room), but positively if it only occupies a room.

Table A4 shows the Logit results for the probability of a birth occurring within the household in the year preceding the first phase of the survey. Virtually all of the modalities and variables are significant at the 1% level. The probability is positively related to the number of married women and men and to a variety of variables representing the incidence of marriage for household members. It is also positively related to family income and to a higher socio-professional category of the head of the household. However, it is negatively related to the number of single men in the household. Moreover, the probability of a birth is increasing in the number of children in the household aged between 3 and 15, presumably because this is an indicator of a propensity to have one more birth. However, having at least one child under three affects the likelihood of a new birth negatively, perhaps due to the spacing of births.

Table A5 shows the results for the probability of a wedding. Each of these variables and modalities is significant at the 1% level, apart from the number of divorced men. We find that the probability of a wedding having occurred within the 12 months preceding the survey depends positively on the number of single, divorced and widowed women, the number of single men and family income. It is also higher if the head is already married polygamously and lower if the head is married monogamously (no men declared themselves as widowers).

These three models are intuitively consistent with the idea that better socioeconomic living conditions lead to higher life expectancy, and that births and weddings are more likely to happen in households with a younger head and more women within an age range for giving birth.

4 Investment Behaviour

We develop an identification strategy that reflects how exposure to expenditure on family ceremonies may affect investment, while nonetheless controlling for elements of profitability through variables that are primarily enterprise-related, as well some other aspects of family circumstances. We start with OLS estimates of the amount of investment. Irrespective of whether we control for potential omitted-variable bias, including sector-specific fixed effects, these suggest that family ceremonies play a significant role in investment (see Table A1 for the sector classification we use).[18] However, because of the zero-inflated distribution of investment (only 30% of enterprises invest over our surveyed period) the OLS estimates are unfit to capture the causal effects of interest here. We therefore test Tobit and two-part models to estimate whether and to what extent ceremony exposure plays a role in the decision to invest and in the amount invested (Tobin, 1958). While the Tobit models are based on the assumption that the determinants of the decision to invest are the same as the ones influencing the amount invested, the two-part model specification allows the determinants of these two aspects of investment decision-making to differ (Duan et al., 1983, 1984). To control for noise, we apply different thresholds for the definition of 'zero' investment.

In the literature, the effects of finance constraints and other determinants of investment are typically tested in terms of the rate of investment, that is, by using investment divided by the initial capital stock as the dependent variable.[19] However, in our sample the capital stock of many enterprises is zero or close to zero (27% of firms have a capital stock of less than 10,000 CFA francs). We therefore we use the level of (gross) investment as the dependent variable.

[18] Although we include sector-specific fixed effects in all the regressions we report here, we have also run these regressions without fixed effects and found similar results.

[19] For extensive references and a critique of the literature, see Chen and Chen (2012).

In addition to our measure of family financial exposure to ceremony expenditures, we include two explanatory variables related to the family sphere: family income, and the number of household members reported as unemployed, that is, available for work but not employed. Greater family ceremony exposure, or financial stresses resulting from lower family income or having family members unemployed may put pressure on the family's finances resources, potentially limiting the amount available for investment. However, as unemployed family members constitute an easily available pool of available workers, their presence may investment more attractive.[20]

The explanatory variables representing the enterprise sphere in our analysis are enterprise age, initial capital stock and employment, as defined in Section 2 above. Intuitively, enterprise age can impact investment positively from greater skills acquired through learning by doing, but it may also have a negative effect, as younger enterprises may be more attuned to recent profitable opportunities. Similarly, the capital stock might have a positive association with investment because a recently growing business might have greater opportunities to expand further, or the association might be negative because capital needs are more likely already to have been met. However, both the enterprise age and capital stock variables represent bygones. In contrast, employment is a variable factor and may give a better reflection of business prospects. Thus we may expect investment to be positively associated with the employment variable.

For the subset of households that we use in our investment estimates, summary statistics are shown in Table 4. For these households, mean family income is about 50% larger than in the full sample, and the mean number of unemployed is nearly 20% higher. Table A6 in the appendix shows the covariances between all the explanatory variables for each of the investment thresholds used in our econometrics and for enterprises that do not invest. All covariances are numerically less than 0.5, and only the covariance between family financial exposure and family income is numerically greater than 0.4.

	obs	**mean**	**min**	**max**	**st dev**
ceremony exposure	1,014	0.27	0.06	0.95	0.15
family income	1,014	0.23	0.00	2.13	0.26
unemployed	1,013	0.57	0	7	0.93
enterprise age	1,006	9.46	0	63	8.96
capital	1,014	190	0	16389	871
labour	1,011	1.68	1	11	1.46

Table 4 Summary Statistics for Investment Estimation

[20] It is also possible that the need to support unemployed household members will cause an entrepreneur to invest more in the pursuit of greater returns.

4.1 OLS Estimates

The OLS regression results for the full sample of enterprises are shown in Table 5, where investment is in 1,000 CFA franc units and family income in units of 10m CFA francs. The regressions do not explain investment per se, but instead they attempt to establish the impact of family-related variables on investment behaviour.

In Model (1) we include two enterprise-related independent variables, enterprise age and capital stock, along with our main variable of interest, the exposure to expenditures associated with family ceremonies. In Model (2) we add our third enterprise-related variable, labour. Models (3) and (4) include the same combinations of independent variables as (1) and (2), respectively, but with our second family-related variable, family income, also included. Then in Models (4)-(6) we introduce the variable representing unemployment in the family, first excluding enterprise labour, then instead excluding family income, and finally, in Model (7), including all variables.

The results show a significant and consistent negative impact of family ceremony exposure in each specification. Focusing on Model (7), which includes all the variables, a 0.1 increase in the probability of a ceremony expenditure is associated with a 3,217 CFA francs lower level of investment. Using the figures in Table 2, this was 12.9% of mean investment for all enterprises, and 4.8% for those that invested. Family income has a positive effect on investment, as intuitively expected, though the effect is very small. We noted above the conflicting effects that, intuitively, the unemployment variable might have on investment. In Table 5 this variable is consistently positive and highly significant, suggesting that the availability of the labour of the unemployed is the dominant factor. In Model (7), having one more unemployed person in the family is associated with a 2,572 CFA francs higher level of investment.

Enterprise age has a statistically significant negative effect in each of these OLS models. Thus, our OLS estimates suggest that the dominant impact of this variable is through the exploitation of business opportunities by more recently established enterprises. Throughout, the capital variable has a highly significant negative impact and labour a highly significant positive impact on investment. We have already noted the conflicting effects that these variables may have on investment, and we discuss this further in the context of our TPM specifications.

Although these models indicate consistently significant causal effects of ceremony exposure on investment, they cannot be used to predict investment (R^2 is very small) due to the unfitted predicted value of investment, the noise around zero, and the fact that the period of observation is short and investment lumpy.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
ceremony expos	-10.923^{***}	-15.732^{***}	-24.830^{***}	-27.913^{***}	-29.474^{***}	-19.174^{***}	-32.170^{***}
	(3.146)	(3.140)	(3.517)	(3.506)	(3.620)	(3.230)	(3.608)
fam inc			18.772^{***}	16.511^{***}	19.438^{***}		17.129^{***}
			(2.124)	(2.118)	(2.128)		(2.122)
unemployed					2.800^{***}	2.329^{***}	2.572^{***}
					(0.517)	(0.515)	(0.516)
ent age	-0.828^{***}	-1.002^{***}	-0.807^{***}	-0.982^{***}	-0.800^{***}	-0.996^{***}	-0.975^{***}
	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)
capital	-0.010^{***}	-0.013^{***}	-0.010^{***}	-0.013^{***}	-0.010^{***}	-0.013^{***}	-0.013^{***}
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
labour		9.423^{***}		9.321^{***}		9.402^{***}	9.294^{***}
		(0.337)		(0.337)		(0.337)	(0.337)
F	602.19	622.29	554.94	575.81	511.26	572.24	533.54
R^2	0.052	0.059	0.053	0.060	0.053	0.059	0.060
Adjusted R^2	0.052	0.059	0.053	0.060	0.053	0.059	0.060

Table 5 OLS Regressions for Investment (No Threshold)
109,018 observations; fixed effects in all models;***: significant at 1%

4.2 Tobit Estimates

Using Tobit regressions, we estimate to what extent exposure to family ceremonies plays a role in the decision to invest and, for those that invest, in the choice of investment amount. However, the investment data show a concentration at and close to zero, and we conjecture that at very low levels, the amount of investment may depend largely on various small enterprises' budget variations not captured in the data. To minimize noise, we therefore define investment to be positive if it is above a specified threshold. We focus on the case of a 5,000 CFA franc threshold (equivalent to about 7 euros at the time the data were collected), but we also compare the results with those for no threshold and a 10,000 CFA franc threshold.[21]

There are two functional reasons for a threshold. The first relates to the definition of investment, since the distinction between capital formation and an enterprise's current expenses may be blurred at a very low level of investment and questions in the survey do not allow this distinction. Secondly, we conjecture that when investment expenditure is at a very low level it may be less affected by financial shocks and stresses from family-related expenditure.

For the cohort of enterprises that invest, the Tobit model specification constrains the coefficients to be the same for both the decision to invest and the amount invested. The results for the 5,000 CFA franc threshold are shown in Table 6. The maximum likelihood estimators for family ceremony exposure are highly significant in all specifications. The signs and significance of all variables are the same as in the OLS testing in each model.

The corresponding Tobit regression results for no threshold and a 10,000 CFA franc threshold are shown in Tables A7a and A7b, respectively, in the appendix. Predominantly, these results are qualitatively similar to those in Table 6. The main difference is that, unlike for the 5,000 and 10,000 CFA thresholds, with no threshold investment is not positively associated with the number unemployed. Instead the coefficient is negative with 1% and 5% significance in two of the models, while in one model there is not a significant relationship. It appears that supporting the unemployed may discourage investment of very small amounts, but that when only larger amounts of investment are considered, the availability of unused household labour may be seen as advantage in exploiting potentially profitable opportunities.

[21] We have also run our OLS regressions with these alternative thresholds for investment. The results are qualitatively similar to those shown in Table 5.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ceremony expos	−75.103***	−98.578***	−142.127***	−138.251***	−156.026***	−108.879***	−151.442***
	(13.252)	(13.138)	(15.100)	(14.913)	(15.626)	(13.599)	(15.431)
fam inc			81.356***	49.511***	83.280***		51.428***
			(8.609)	(8.689)	(8.618)		(8.699)
unemployed					7.279***	6.073***	6.882***
					(2.083)	(2.045)	(2.049)
ent age	−3.356***	−4.623***	−3.247***	−4.536***	−3.233***	−4.609***	−4.517***
	(0.223)	(0.226)	(0.223)	(0.226)	(0.223)	(0.226)	(0.226)
capital	−0.039***	−0.063***	−0.039***	−0.063***	−0.039***	−0.063***	−0.063***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
labour		51.676***		50.990***		51.672***	50.960***
		(1.271)		(1.276)		(1.271)	(1.276)
$LR\ \chi^2$	3184.81	4799.76	3272.90	4831.91	3285.05	4808.54	4843.13
Prob $> \chi^2$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R^2	0.009	0.014	0.010	0.014	0.010	0.014	0.014

Table 6 Tobit Regressions for Investment (5,000 CFA franc Threshold)
1,006 observations; 172 uncensored; fixed effects in all models; ***: significant at 1%

4.3 TPM Estimates

Like Tobit models, two part models (TPM) are suited for continuous variables that have a zero-inflated distribution, but they differ from Tobit models in that the coefficients for the two parts of the distribution do not have to be identical. In the present case, two-part models allow us to estimate the determinants of the decision to invest independently from estimates of the variation in the amount invested. The first part of TPM estimates the decision to invest using Logit regression, while the second part consists of an OLS regression of the determinants, for those that invest, of the amount invested by the enterprise.

Our identification strategy is the same as the one used above, with the same explanatory variables. As in the Tobit specification, we focus on the 5,000 CFA franc investment threshold (Tables 7a and 7b), but we also consider the results no threshold (Tables A8a and A8b in the appendix) and a 10,000 CFA franc threshold (Tables A9a and A9b in the appendix). Allowing the coefficients of the two components of the investment decision to differ reveals some interesting features of entrepreneurial behaviour.

From Tables 7a and 7b, both the decision to invest and the amount of investment have highly significant negative relationships with ceremony exposure. This result is insensitive to the inclusion in the regressions of other independent variables. From Table 7a, in Model (7), where all the independent variables are included, the Logit coefficient translates into an odds ratio of 4.01 against investing. From Table 7b, in Model (7) a 0.1 increase in the probability of expenditure on a ceremony is associated with a 6,985 CFA francs lower level of investment, which is 10.4% of the mean investment of enterprises in the dataset that invested. Similar results are obtained for the zero and 10,000 CFA franc investment thresholds.

However, the results for family income are less clear-cut. For the decision to invest, family income does not have a significant effect with the zero threshold, but it has a highly significant positive effect for the higher thresholds. It may be, for example, that when small amount maintenance is needed, for example purchasing replacement nuts and bolts, it will be undertaken, but how far to cut corners might depend on family income. For the amount invested, family income has a highly significant positive effect with no investment threshold, uneven significance for the 5,000 CFA franc threshold, and none with the 10,000 CFA franc threshold. Thus, low family income may hold back an entrepreneur from making a larger investment, but if the investment is to be made, other factors become dominant.

	Logit						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
ceremony expos	-0.438^{***}	-0.543^{***}	-0.566^{***}	-0.621^{***}	-0.554^{***}	-0.525^{***}	-0.603^{***}
	(0.053)	(0.054)	(0.060)	(0.060)	(0.062)	(0.056)	(0.062)
fam inc			0.168^{***}	0.106^{***}	0.167^{***}		0.104^{***}
			(0.035)	(0.036)	(0.035)		(0.036)
unemployed					-0.007	-0.011	-0.010
					(0.009)	(0.009)	(0.009)
ent age	-0.005^{***}	-0.010^{***}	-0.005^{***}	-0.010^{***}	-0.005^{***}	-0.010^{***}	-0.010^{***}
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
capital	0.000^{***}	0.000^{***}	0.000^{***}	0.000^{***}	0.000^{***}	0.000^{***}	0.000^{***}
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
labour		0.184^{***}		0.184^{***}		0.184^{***}	0.184^{***}
		(0.005)		(0.005)		(0.005)	(0.005)
$LR\ \chi^2$	2366.81	2931.48	2389.60	3700.27	2390.17	3693.21	3701.60
Prob $> \chi^2$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R^2	0.021	0.033	0.022	0.034	0.022	0.034	0.034

Table 7a TPM Logit Regressions for Investment (5,000 CFA franc Threshold)
1,006 observations; fixed effects in all models; ***: significant at 1%.

	OLS						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
fam expos	−22.983*	−44.753***	−51.970***	−39.488**	−83.647***	−71.510***	−69.849***
	(13.805)	(13.763)	(16.060)	(15.968)	(16.743)	(14.372)	(16.651)
fam inc			32.014***	−6.028	36.155***		−1.834
			(9.070)	(9.270)	(9.083)		(9.285)
unemployed					13.570***	13.001***	12.973***
					(2.050)	(2.032)	(2.037)
ent age	−3.485***	−4.111***	−3.409***	−4.131***	−3.418***	−4.130***	−4.136***
	(0.230)	(0.231)	(0.231)	(0.233)	(0.230)	(0.231)	(0.233)
capital	−0.067***	−0.089***	−0.068***	−0.089***	−0.065***	−0.086***	−0.086***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
labour		25.572***		25.799***		25.571***	25.640***
		(1.440)		(1.482)		(1.439)	(1.481)
F	800.91	767.06	729.61	703.15	673.74	707.81	653.34
R^2	0.265	0.275	0.265	0.275	0.267	0.276	0.276
adjusted R^2	0.264	0.275	0.265	0.275	0.266	0.276	0.276

Table 7b TPM OLS Regressions for Investment (5,000 CFA franc Threshold)
22,720 observations; fixed effects in all models; ***: significant at 1%; **: significant at 5%.

The number unemployed has a highly significant positive effect on the amount invested for each threshold. As above, we attribute this result to the benefit for an entrepreneur of having labour resources relatively available. However, for the decision to invest, the number unemployed has a highly significant negative effect for a zero threshold, no significant effect for the 5,000 CFA franc threshold, and a highly significant positive effect for the 10,000 CFA franc threshold. Together, these results suggest that the need to support unemployed members of the household may stop low levels of investment, but not higher ones. Everyday expenses may take priority unless there is a distinct opportunity that requires a larger investment outlay.

Except in one case, the results for enterprise age are highly significant and negative, as in our earlier specifications. The exception is for the Logit with no threshold. In this case there is a highly significant positive relationship with investment, though the effect is small. Thus, when the smallest level of investment is included, older enterprises seem more likely to invest. Since the investment data are gross, this may because expenditure is made on small repairs, which would presumably be more common for older equipment. However, when very small investments are excluded from the regressions, there is more likely to be investment in newer enterprises, which as we have argued, may be because these enterprises are more attuned to new profit opportunities. A similar argument applies with respect to the amount of investment for all three levels of threshold.

Enterprise capital has a highly significant negative relationship with the amount of investment for all three thresholds, as in our earlier specifications. However, there is an (approximately) zero effect of the amount of enterprise capital on the decision to invest in all three cases. This may be because the amount of capital is a by-gone and so may be a poor reflection of current profit prospects. In contrast, if an entrepreneur does invest, it appears that there is a tendency towards equalization of capital stock sizes. There may be exogenous factors, such as the general business environment and risk aversion that tend inhibit further expansion in larger enterprises.

Finally, as we found for the simple OLS and Tobit specifications, for both the decision to invest and the amount of investment, there is a highly significant positive relationship with the amount of labour in the enterprise. Unlike the amount of capital, the amount of labour may be as a proxy for profit prospects because it can be much more easily varied to reflect market conditions.

There is a large amount of noise in our data that influences investment, partly because we rely on an enterprise survey, which explains the very low R^2. However, we are not trying to explain investment per se, only to test the causal impact of exposure to expenditure on family ceremonies. Our results show that such exposure can significantly reduce the probability of investment and the amount

invested (conditional of there being an investment). Limited family income may also constrain investment, though the results are less clear-cut. However, the family can be an asset, for we have found that having more unemployed members of the family can have a positive effect on investment.

5 Conclusion

In this paper we analyze some of the determinants of investment by informal enterprises using data from a West African country. Our hypothesis is that investment behaviour depends not only on enterprise-related variables, but also family circumstances. We focus on the role of expenditures associated with weddings, funerals and birth ceremonies because, partly for social reasons, these are generally large relative to family income. We test this hypothesis using a survey that combines data on informal firms in Sénégal with data on the entrepreneur's family characteristics and living standards. Our results show a highly significant negative association of investment with the probability of at least one ceremony in the entrepreneur's family. The results are robust to a variety of estimation methods and the size of this effect is substantial within each estimation method, whether or not other variables are included in the specification. Although spending on ceremonies may yield social and conspicuous consumption benefits to families, it may constrain future consumption through the investment channel (and presumably also through the effect on savings).

Family income also impacts investment behaviour, although its role is more complex. We find no evidence that lower family income deters investment at a very low level, though it does influence the amount of investment chosen. Conversely, at higher levels of investment, family income does seem to influence the decision to invest, but not the amount. We also find that the effect of having unemployed workers in the household depends on the level of investment considered. Perhaps because they are perceived as a burden on family finances, unemployed workers have a negative impact on the decision to invest small amounts. However, for the decision to invest larger amounts, and for the amount of investment, unemployed workers have a positive effect, suggesting that the entrepreneur sees them as a useful resource in conjunction with the new capital stock.

Further research might examine how far the results we have found would hold for more formal and larger enterprises, and for enterprises operating in sectors that are less represented in the informal sector survey (e.g., those with a higher capital intensity). More generally, the measure of family financial exposure that we have used relates to three particular types of ceremony, but it would be interesting to analyze the relationship of physical investment with other types of expenditure, such as on health. The extent to which the amount spent on each type of cer-

emony may be limited to accommodate investment in enterprises might also be investigated.

Appendix

Sector (1,014 enterprises)	**Frequency**	**Percent**
services	121	11.93
construction	92	9.07
commerce	34	3.35
wood and metal work	250	24.65
retail	50	4.93
hotels and restaurants	19	1.87
fishing	54	5.33
transport	394	38.86

Table A1 Sectoral Classification of Enterprises (Phase-2 Survey)

	obs	**mean**	**min**	**max**	**st dev**
All Enterprises					
age (years)	1006	9.46	0	63	8.96
labour	1011	1.68	1	11	1.46
capital stock (CFA francs 000)	1014	189.62	0	16389	870.94
profit (CFA francs 0000)	968	123.00	0	3900	247.00
investment (CFA francs 000)	1014	24.24	0	2561	165.60
Investment > 5,000 CFA francs					
age (years)	172	8.83	0	62	9.37
labour	174	2.20	1	11	1.69
capital stock (CFA francs 000)	175	167.40	0	2998	461.85
profit (CFA francs 0000)	170	210.83	1.2	2172	351.12
investment (CFA francs 000)	175	137.07	6	2561	379.65
Investment > 10,000 CFA francs					
age (years)	124	8.32	0	62	9.96
labour	124	2.31	1	11	1.69
capital stock (CFA francs 000)	124	214.17	0	2998	529.48
profit (CFA francs 0000)	120	235.32	1.2	2172	370.04
investment (CFA francs 000)	124	190.36	11	2561	440.54

Table A2 Summary Statistics for Alternative Investment Thresholds

Variable	**Modality**	**Coefficient**	**(Std. Err.)**
no. of widows	numerical	0.610^{***}	(0.047)
1 if $\geq$ one child aged under 1	0 or 1	0.851^{***}	(0.028)
1 if $\geq$ one child aged from 1 to 3	0 or 1	-0.467^{***}	(0.023)
1 if $\geq$ one person disabled	0 or 1	0.271^{***}	(0.028)
no. of people aged 45-55	numerical	0.541^{***}	(0.015)
no. of people aged > 55	numerical	0.201^{***}	(0.014)
1 if living in flat	0 or 1	-1.025^{***}	(0.041)
1 if living in room	0 or 1	0.542^{***}	(0.025)
1 if domestic electricity	0 or 1	-0.143^{***}	(0.027)
family income	numerical	-0.004^{***}	(0.001)
constant		-3.529^{***}	(0.033)
$LR\ \chi^2_{(10)}$	5003.6		
Prob $> \chi^2$	0.000		
Pseudo R^2	0.058		

Table A3 Probability of a Funeral: Logit Estimation Results
258,602 observations; ***: significant at 1%

Variable	**Modality**	**Coefficient**	**(Std. Err.)**
no. of married women	numerical	0.400^{***}	(0.009)
no. of single women (aged $\geq$ 16)	numerical	-0.012^{**}	(0.006)
no. of married men	numerical	0.349^{***}	(0.009)
no. of single men (aged $\geq$ 16)	numerical	-0.012^{***}	(0.004)
1 if one housewife	0 or 1	0.223^{***}	(0.015)
1 if $\geq$ one housewives	0 or 1	0.216^{***}	(0.020)
1 if $\geq$ one child aged under 3	0 or 1	-0.243^{***}	(0.009)
no. of children aged 3-15	numerical	0.158^{***}	(0.003)
1 if head married (monogamous)	0 or 1	1.098^{***}	(0.022)
1 if head married (polygamous)	0 or 1	1.363^{***}	(0.023)
family income	numerical	0.001^{***}	(0.000)
1 if head is skilled employee	0 or 1	-1.318^{***}	(0.041)
1 if head is unskilled employee	0 or 1	0.019	(0.031)
1 if head is employer	0 or 1	0.080^{***}	(0.028)
1 if head is unemployed	0 or 1	0.133^{***}	(0.029)
constant		-3.862^{***}	(0.033)
$LR\ \chi^2_{(15)}$	2038.40		
Prob $> \chi^2$	0.000		
Pseudo R^2	0.104		

Table A4 Probability of a Birth: Logit Estimation Results
258,602 observations; ***: significant at 1%; **: significant at 5%

Variable	**Modality**	**Coefficient**	**(Std. Err.)**
no. of single women (aged $\geq$ 16)	numerical	0.171^{***}	(0.006)
no. of divorced women	numerical	0.391^{***}	(0.023)
no. of widows	numerical	1.009^{***}	(0.036)
no. of single men (aged $\geq$ 16)	numerical	0.128^{***}	(0.040)
no. of divorced men	numerical	0.021	(0.004)
family income	numerical	0.008^{***}	(0.000)
1 if head married (monogamous)	0 or 1	-0.743^{***}	(0.023)
1 if head married (polygamous)	0 or 1	0.133^{***}	(0.023)
constant		-3.228^{***}	(0.021)
$LR\ \chi^2_{(8)}$	6681.8		
Prob $> \chi^2$	0.000		
Pseudo R^2	0.061		

Table A5 Probability of a Wedding: Logit Estimation Results
258,602 observations; ***: significant at 1%

Table A6a Covariance Matrix for Full Sample of Enterprises

	cere exp	fam inc	unemp	ent age	capital	ent emp
cere exp	1.000					
fam inc	0.475	1.000				
unempl	0.286	0.119	1.000			
ent age	0.130	0.025	0.032	1.000		
capital	-0.002	0.078	-0.062	0.216	1.000	
ent emp	0.080	0.176	-0.028	0.221	0.201	1.000

Table A6b Covariance Matrix for Enterprises Investing over 5,000 CFA francs

	cere exp	fam inc	unemp	ent age	capital	ent emp
cere exp	1.000					
fam inc	0.448	1.000				
unempl	0.371	0.115	1.000			
ent age	0.242	0.088	0.107	1.000		
capital	0.029	0.105	−0.068	0.265	1.000	
ent emp	0.014	0.163	−0.048	0.285	0.224	1.000

Table A6c Covariance Matrix for Enterprises Investing over 10,000 CFA francs

	cere exp	fam inc	unemp	ent age	capital	ent emp
cere exp	1.000					
fam inc	0.430	1.000				
unempl	0.286	0.111	1.000			
ent age	0.002	−0.009	−0.044	1.000		
capital	−0.018	0.046	0.019	0.009	1.000	
ent emp	0.103	0.010	0.090	0.139	0.181	1.000

Table A6d Covariance Matrix for Enterprises Not Investing

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
cerem expos	-85.728^{***}	-94.913^{***}	-106.832^{***}	-105.754^{***}	-102.620^{***}	-90.619^{***}	-101.287^{***}
	(7.017)	(6.969)	(7.866)	(7.800)	(8.074)	(7.158)	(8.005)
fam inc			27.723^{***}	14.462^{***}	27.242^{***}		13.923^{***}
			(4.641)	(4.655)	(4.648)		(4.662)
unemployed					-2.655	-2.977^{***}	-2.818^{**}
					(1.149)	(1.136)	(1.137)
ent age	-0.489^{***}	-0.905^{***}	-0.460^{***}	-0.886^{***}	-0.462^{***}	-0.908^{***}	-0.889^{***}
	(0.113)	(0.112)	(0.113)	(0.113)	(0.113)	(0.112)	(0.112)
capital	-0.070^{***}	-0.084^{***}	-0.070^{***}	-0.084^{***}	-0.070^{***}	-0.084^{***}	-0.084^{***}
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
labour		24.872^{***}		24.692^{***}		24.878^{***}	24.704^{***}
		(0.703)		(0.706)		(0.703)	(0.706)
$LR\ \chi^2$	3085.13	4311.61	3120.61	4321.24	3125.97	4318.50	4327.39
Prob $> \chi^2$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R^2	0.005	0.006	0.005	0.007	0.005	0.007	0.007

Table A7a Tobit Regressions for Investment (No Threshold)

1006 observations; 358 uncensored; fixed effects in all models; ***: significant at 1%; **: significant at 5%

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ceremony expos	−109.359***	−129.311***	−196.707***	−179.270***	−211.314***	−139.830***	−193.412***
	(18.176)	(17.981)	(20.526)	(20.226)	(21.356)	(18.716)	(21.045)
fam inc			106.858***	63.127***	108.816***		65.094***
			(11.377)	(11.524)	(11.396)		(11.543)
unemployed					7.179**	5.758**	6.877**
					(2.854)	(2.805)	(2.811)
ent age	−6.340***	−8.027***	−6.193***	−7.910***	−6.173***	−8.007***	−7.884***
	(0.308)	(0.314)	(0.308)	(0.315)	(0.308)	(0.314)	(0.315)
capital	−0.013***	−0.039***	−0.014***	−0.039***	−0.014***	−0.039***	−0.039***
	(0.004)	(0.005)	(0.004)	(0.005)	(0.004)	(0.005)	(0.005)
labour		65.056***		64.115***		65.065***	64.096***
		(1.672)		(1.680)		(1.672)	(1.679)
$LR\ \chi^2$	3522.09	5008.68	3608.87	5038.34	3615.21	5012.88	5044.30
Prob $> \chi^2$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R^2	0.014	0.019	0.014	0.019	0.014	0.019	0.019

Table A7b Tobit Regressions for Investment (10,000 CFA franc Threshold)
1006 observations; 124 uncensored; fixed effects in all models; ***: significant at 1%; **: significant at 5%

	Logit						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
ceremony expos	−0.700***	−0.772***	−0.708***	−0.752***	−0.588***	−0.659***	−0.627***
	(0.045)	(0.045)	(0.050)	(0.050)	(0.051)	(0.050)	(0.051)
fam inc			0.012	−0.026	−0.003		0.043
			(0.030)	(0.030)	(0.030)		(0.030)
unemployed					−0.075***	−0.077***	−0.078***
					(0.007)	(0.007)	(0.008)
ent age	0.006***	0.004***	0.006***	0.004***	0.006***	0.004***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
capital	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
labour		0.122***		0.122***		0.122***	0.123***
		(0.005)		(0.005)		(0.005)	(0.005)
$LR\ \chi^2$	2981.88	3668.66	2982.03	3669.41	3085.47	3779.50	3781.50
Prob $> \chi^2$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R^2	0.021	0.026	0.021	0.026	0.022	0.026	0.026

Table A8a TPM Logit Regressions for Investment (No Threshold)
1,006 observations; fixed effects in all models; ***: significant at 1%.

	OLS						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
ceremony expos	−17.555**	−17.929**	−45.058***	−31.999***	−65.712***	−36.712***	−52.411***
	(17.989)	(7.953)	(8.962)	(8.955)	(9.156)	(8.143)	(9.149)
fam inc			35.520***	18.186***	37.279***		20.009***
			(5.259)	(5.325)	(5.254)		(5.320)
unemployed					14.048***	13.678***	13.838***
					(1.315)	(1.309)	(1.310)
ent age	−2.082***	−2.205***	−2.045***	−2.182***	−2.088***	−2.248***	−2.223***
	(0.123)	(0.123)	(0.123)	(0.123)	(0.123)	(0.123)	(0.123)
capital	−0.021***	−0.035***	−0.022***	−0.035***	−0.021***	−0.034***	−0.034***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
labour		15.125***		14.628***		15.099***	14.552***
		(0.796)		(0.809)		(0.795)	(0.808)
F	1190.84	1125.16	1087.94	1032.64	1009.60	1043.27	964.42
R^2	0.229	0.236	0.230	0.236	0.232	0.238	0.238
adjusted R^2	0.229	0.236	0.230	0.236	0.231	0.238	0.238

Table A8b TPM OLS Regressions for Investment (No Threshold)
40,085 observations; fixed effects in all models; ***: significant at 1%; **: significant at 5%.

	Logit						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
ceremony expos	-0.483^{***}	-0.560^{***}	-0.750^{***}	-0.766^{***}	-0.877^{***}	-0.664^{***}	-0.884^{***}
	(0.064)	(0.064)	(0.072)	(0.072)	(0.075)	(0.067)	(0.075)
fam inc			0.326^{***}	0.262^{***}	0.337^{***}		0.274^{***}
			(0.040)	(0.041)	(0.040)		(0.041)
unemployed					0.065^{***}	0.058^{***}	0.061^{***}
					(0.010)	(0.010)	(0.010)
ent age	-0.021^{***}	-0.026^{***}	-0.020^{***}	-0.026^{***}	-0.020^{***}	-0.026^{***}	-0.026^{***}
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
capital	0.000^{***}	0.000	0.000^{***}	0.000	0.000^{***}	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
labour		0.191^{***}		0.188^{***}		0.190^{***}	0.188^{***}
		(0.006)		(0.006)		(0.006)	(0.006)
$LR\ \chi^2$	3490.28	4597.52	3554.21	4637.32	3597.09	4631.95	4675.55
Prob $> \chi^2$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R^2	0.040	0.053	0.041	0.054	0.042	0.054	0.054

Table A9a TPM Logit Regressions for Investment (10,000 CFA franc Threshold)
1,006 observations; fixed effects in all models; ***: significant at 1%.

	OLS						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
ceremony expos	−83.583***	−84.973***	−99.908***	−66.976***	−135.219***	−113.602***	−98.887***
	(21.524)	(21.433)	(24.177)	(24.251)	(26.011)	(22.968)	(26.106)
fam inc			17.689	−19.558	22.671		−14.723
			(11.934)	(12.333)	(12.006)		(12.416)
unemployed					10.389***	9.685***	9.289***
					(2.830)	(2.800)	(2.820)
ent age	−1.145***	−1.860***	−1.101***	−1.936***	−1.117***	−1.885***	−1.942***
	(0.326)	(0.331)	(0.327)	(0.334)	(0.327)	(0.331)	(0.334)
capital	−0.057***	−0.076***	−0.057***	−0.076***	−0.054***	−0.073***	−0.073***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)
labour		22.565***		23.448***		22.543***	23.208***
		(2.003)		(2.079)		(2.003)	(2.080)
F	700.56	653.85	637.12	599.63	585.65	600.81	554.71
R^2	0.323	0.328	0.323	0.328	0.323	0.329	0.329
adjusted R^2	0.322	0.328	0.322	0.328	0.323	0.328	0.328

Table A9b TPM OLS Regressions for Investment (10,000 CFA franc Threshold)
14,730 observations; fixed effects in all models; ***: significant at 1%.

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