Ever since John von Neumann’s game theory promised to help us understand love and marriage, economists have been interested in how people choose their partners and how relationships work.

It takes two to tango, and it also takes two to get married. Marriage therefore requires you to go out and find someone you want to marry, and persuade them to marry you. It's a matching problem, and it is not unique to marriage. Getting a job is emotionally a different proposition to finding a wife or husband, but in some ways it's similar: you need to consider a range of jobs, work out which ones you prefer, and persuade the employer that he likes the match as much as you do. And just as in the job market, who matches up with whom, and on what terms, will depend on what the competition is offering.

Whom you marry depends on where you live, but also on how old you are and what race you are. Most people marry people of the same race, of a similar age and from the same area. 96 percent of married black women have black husbands, and over 96 percent of married white women have white husbands.

What might cause an imbalance in some of these local marriage markets? Imbalances in cities might be caused by unskilled young men rationally deciding to give up and move to the country, or stay there in the first place. But another major reason for men being absent from local marriage markets is prison. There are two million men in US prisons and just 100,000 women; and the men in prison are spread unevenly across age, race and geography. Huge numbers of young black men are in prison, and that is bound to pose a problem for the young black women they might otherwise have married. (It might also pose a problem for women of other races and in other states—but only if some women were inclined and able to hop from one marriage market to a better one. That does not seem to happen often enough to cancel out the effect of the shortage of marriageable young black men.)
In New Mexico, for example, 30 percent of young black men, aged 20-35, are in prison (or, less commonly, in a secure mental institution). That is an extreme case, but there are 32 states with more than one in ten young black men in prison, and ten states where one in six young black men are behind bars. That is a serious business for young black women.

According to economists Kerwin Kofi Charles and Ming Ching Luoh, where a large number of a particular racial group is in prison, women of the same age and race in that state do not enjoy the gains from marriage, or a stable relationship, that women in a more equitable situation do.

Charles and Luoh show that young black women facing a shortage of men try to increase their attractiveness as marriage prospects. The more men are in prison, the more likely women are to get themselves a job, and the more likely they are to go to college. College-educated people are much more likely to marry other college-educated people, so an education doesn't just make you smart, it wins you a smart husband or wife.

Improving their bargaining position in the marriage market is, of course, not the only likely reason for these decisions. Since the high incarceration rates of young black men mean young black women are less likely to marry, a college degree and a job look like a rational investment for a single girl who can't rely on a partner as a source of income. What's more, the likelihood of young black women not marrying is greatly exacerbated by another trend: it appears that young black men who are not in prison typically take advantage of their strong bargaining position by not bothering to marry at all.

Charles and Luoh are able to examine this statistically because they have data across all 50 states and for the 1980, 1990 and 2000 census. So they are able to compare the situation of women in different times and places, taking into account background trends as they vary across the country and from decade to decade. They estimate, for instance, that a one percentage point rise in the proportion of young black men in prison reduces the proportion of young black women who have ever been married by three percentage points. In states where 20 or 25 percent of the available men are in prison, young black women become very unlikely to marry. The effect is even more dramatic for uneducated women, since women tend to pair up with men of a similar education level, and uneducated men are particularly likely to end up in jail.

There are a lot of African-American single moms around, and some commentators are inclined to blame this fact on "black culture"—whatever that phrase might mean. But "black culture" doesn't explain why the single moms are disproportionately in the states where lots of young black men are in prison. Economics does: women's bargaining power is badly dented by the imprisonment of potential husbands. The better-educated guys stay out of jail, and they are smart enough to realize that with the competition locked up, they don't have to get married to enjoy themselves. "Culture" is no explanation; that women respond rationally to a tough situation is a much better one.

Even though it's mostly uneducated men that end up in prison, Charles and Luoh show that the negotiating position of women is so weakened that they end up more likely, not less, to "marry down"—that is, to marry men who are less educated than they are. So there's another reason for young black women to put more efforts into getting a degree and a job: even if they could find a
husband, we could understand them being concerned that he wouldn't be a high-quality husband: maybe they couldn't rely on him to stay around, be a reliable father or a provider for the household. As the song goes, sisters are doing it for themselves—but not, in this case, for very encouraging reasons.

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It's a commonplace observation that the contraceptive pill wrought major changes in society. But when most people hear that, they probably think that the effects were mostly to do with college parties becoming a lot more fun. In fact, rational responses to the pill have had remarkably similar effects to those that come from imprisoning a significant chunk of the male population.

What's the similarity? Both heat up competition among women in the marriage market. Young black men who stay out of prison in a place like New Mexico rarely marry, and this is probably because they realize they do not need to marry to get sex. The contraceptive pill also makes it easier for men to get sex outside of marriage. The logic of evolutionary psychology says that women should be choosy about who they have sex with, because pregnancy in the wrong circumstances is extremely costly—but the logic of a woman who has control of reliable contraception is quite different. The preferences that evolution has shaped still exert powerful influence on our instincts, and many women remain extremely choosy and refuse to have sex outside marriage. But others, once armed with the pill, decided they could afford to have a little more fun.

The choosy ones are unlucky: the existence of other women who are a little freer with their favors weakens the bargaining power of the Madonnas, and means that men have less incentive to marry. Some men will not bother at all, feeling that they can get all they want from a playboy lifestyle. Or they may delay marriage until middle age, cutting down on the pool of marriageable men and increasing male bargaining power.

As we have seen, the rational response is for women to go to college, bringing them both better prospects in the job market and better prospects in the marriage market. Meanwhile, the more capable women become of looking after children by themselves, the less men need to bother. It's a textbook case of free-riding: with highly-educated women in excess supply, men have realized that they can get sex, and even successful offspring, without ever moving too far from the La-Z-Boy chair and the potato chips. Statistics seem to bear this out. There are nowadays four US women graduating from university for every three men, and this is not a particularly American phenomenon: in 15 out of 17 rich countries for which the data are available, more women are graduating than men. The most educated men in the United States were born just after the second world war and graduated in the mid 1960s—male graduation rates dipped after that, and have not yet returned to that peak. The rational choice perspective suggests it is probably not coincidental that this decline set in roughly when women got hold of the contraceptive pill.

Women's rational responses to the pill wrought other, socially far-reaching changes. The ability to delay, and to some extent control, the timings of their pregnancies also allowed women to plan their careers in a new way: rather than hurrying back to work after having children, they could decide to postpone their departure. That made it rational to invest in training for a career with a
long pre-qualification period, such as law, medicine or dentistry. Female enrollment in law and medical school duly soared as the pill became available, because women knew they could qualify and establish themselves in a career without becoming a nun.

Delaying motherhood means big income gains for educated women, because of the economies of scale in education and work which reward those who spend a long time in college and then work long hours early in their careers. For every year by which a woman delays having her first child, her lifetime earnings rise by ten percent. Of course, someone who delays having children might earn more simply because her career is her priority, but you can get around that statistical minefield by looking at women who, because of miscarriages or accidental pregnancies, do not have children at the time they would have chosen. These random misfortunes, which mean women having babies earlier or later than they would have done, all point in the same direction: a year's delay adds about one tenth to lifetime earnings.

The pill also meant women felt more able to postpone marriage—why hurry? They could enjoy sex and a career without rushing to get married. And as more intelligent women delayed getting hitched, that meant that more intelligent men would be floating around, unattached. The dating scene became a more interesting place to dip in and out of for a decade or so, and the risk of being "left on the shelf" plummeted. The fewer people sprinted up the aisle, the less need for others to hurry. It looked like a cultural shift, but it had rational roots.

Another side-effect was on the expectations of potential mentors and employers. They had more confidence that women would not give up on their training or careers because of an accidental pregnancy; that increased confidence meant that more women got a fair chance in the workplace. This, too, was not merely the blinkers of discrimination being lifted from employers' eyes: it was a rational response to a world that had changed.

As we will see tomorrow, the pill also contributes towards a rational explanation of one last, much-discussed social phenomenon of the last fifty years or so: skyrocketing rates of divorce.
sitting at home in Kirkcaldy and penning the most famous passage in economics, he was inspired by an entry in an encyclopedia. The passage is no less important for that.

Smith argued that a general handyman who turned his hand to the business of making pins, … could scarce, perhaps, with his utmost industry, make one pin in a day, and certainly could not make twenty. But in the way in which this business is now carried on, not only the whole work is a peculiar trade, but it is divided into a number of branches, of which the greater part are likewise peculiar trades. One man draws out the wire, another straightens it, a third cuts it, a fourth points it, a fifth grinds it at the top for receiving the head.

Smith reckoned that ten specialized pin-makers, using equipment designed and built by specialists, could produce 48,000 pins a day. Ten generalized handymen could produce perhaps one pin each. In the "trifling" business of making pins, quite rudimentary division of labor multiplied the output per person almost five thousand times. From a rational choice point of view, dividing labor is a no-brainer.

The division of labor is utterly fundamental to the wealth we enjoy in modern economies. Complicated products, such as the computer on which I am typing this paragraph, are unimaginable without the combined and cumulated efforts of the countless specialists who worked out how to manufacture integrated circuits or how to control a computer using a mouse and a pointer on the screen. Most of those specialists couldn't boil an egg, let alone survive alone on a desert island. They are dependent on other people's expertise, if only the expertise of the cooks at the local Chinese take-out, and computer users the world over are dependent on theirs.

Even simple products like the short cappuccino I have beside me would be impossible without the division of labor. Is there anyone in the world who has mastered ceramics, dairy farming and the art of the perfect espresso roast? I'd be bowled over by someone who had any two out of three.

That is all very well, but what does it have to do with marriage? There is not much reason to think that Adam Smith gave the matter much thought: a bachelor, he lived with his mother. Yet marriage used to be one of the fundamental ways to gain from division of labor. Before there were well-developed markets for anything much, and long before you could order a cappuccino, men and women were able to enjoy some of the gains from the division of labor by getting married, specializing, and sharing. Back on the Savannah, one might hunt and the other might gather. In the more recent past, one might be good at guiding a plough and sewing while another would specialize in cooking and household repairs. Nothing about Adam Smith's story suggests division of labor according to traditional sexual roles, but make no mistake: the family has rational roots. It is the oldest pin factory of all.

By the 1950s, those traditional sexual roles were fundamental in the division of labor within marriage. The ideal husband specialized in breadwinning, getting an education, a good job, working whatever hours were necessary to win promotion, and earning ever more to supply the family with a car, a fridge, a nice house in the suburbs and frequent holidays. His adoring wife
specialized in homemaking, cooking, cleaning, entertaining, bringing up the children to be smart and wholesome and taking care of her husband's emotional and sexual needs.

That was the idea, at least, and in 1965, the average married woman worked fewer than 15 hours a week in paid employment. For the typical woman, a stay-at-home mom, that would be zero hours. The average was pulled up by empty-nesters and the very poor. Meanwhile, the average married man worked over 50 hours a week. The roles were neatly reversed for household work: married women did almost 40 hours a week of non-market work, men fewer than ten. This was division of labor all right, and it was division of labor along sexually lopsided lines.

It was economist Gary Becker who showed the implications of Adam Smith's pin factory for marriage in the modern age. How had the division of labor become so sexually lopsided? The answer was the interaction of three economic forces: the division of labor, economies of scale, and comparative advantage.

As Becker knew, division of labor works because it unleashes economies of scale. In plain English, one full-time worker earns more than two half-time workers. That is often true for the most basic jobs, but much more so for the most demanding positions. How many top lawyers do half a law degree and then work twenty-hour weeks? How many successful business executives work only Mondays, Tuesdays and Wednesday mornings? And the top earners, at the peak of a long, full-time career, earn much, much more than those half-way through their careers. It is a harsh truth about the world of work that for many professionals, the more work you have done in the past, the more productive each additional working hour becomes: a perfect example of economies of scale.

This means that a household in which both parents work part-time on their careers and part-time looking after children and the home does not make rational economic sense. Two halves are much less than a whole. Economies of scale dictate that, logically, one partner should apply himself or herself full-time to paid work. The other should work at home-making, and only work for money if there is some spare time available after the household chores.

So far this is classic Adam Smith. Where did the traditional gender roles of the 1950s come from? Becker pointed out the implications of the third economic force, the principle of comparative advantage. Comparative advantage says that division of labor is governed not by who is most productive in some absolute sense, but in a relative sense. In Adam Smith's pin factory, if worker Elizabeth can sharpen two pins a minute and mount four pins a minute in paper, while worker James can sharpen one pin a minute and mount one pin a minute in paper, the logic of comparative advantage says that James should be sharpening pins, even though Elizabeth does the job faster. The relevant comparison is not whether Elizabeth sharpens pins faster than James but whether, relative to him, she sharpens pins faster than she mounts them in paper.

Imagine that James and Elizabeth are married; now, replace mounting pins in paper with looking after babies. Elizabeth is a more productive worker than James but also a more effective parent. James is a bad worker but a worse dad, and so Elizabeth takes the rational decision to stay home baking cookies and looking after the kids, while James tries to scrape together a living as a real
estate agent. The logic of comparative advantage highlighted something that most men—except economists—have found it hard to get their heads around: there is no reason to believe that men were breadwinners because they were any good at it. They might simply have been breadwinners because getting them to help around the house would have been even worse.

Gary Becker's contribution was not to suggest that women make good parents, but to realize that because of economies of scale even a very small difference in innate capabilities could lead to titanic differences in how people actually spent their time. A small difference in relative expertise between men and women would be enough to cause a sharp division of labor across traditional sexual roles. That difference might be because of biological differences, because of socialization, or because of discrimination against women in the workplace, quite likely all three. Rather than arguing for any particular explanation, Becker showed that the difference didn't have to be big to have big effects.

In the late 1970s, Gary Becker was a widower and a single parent, pouring all his intellectual energy into "A Treatise on the Family," published in 1981. (A happy footnote: he remarried shortly before the treatise was published.) One of his aims was to understand what was happening to the institution of marriage. Divorce rates had more than doubled in the past two decades, both in the US and many European countries. It was clear that the world of marriage had changed dramatically.

Some commentators have blamed changes in divorce laws for the trend: Ronald Reagan, then Governor of California, signed a bill introducing "no fault" divorce in 1969, meaning that either partner could simply walk away from the marriage by demanding a divorce. Other states followed. But Becker knew that couldn't be the answer: if the husband wanted a divorce to run off with his mistress, "no fault" divorce didn't make it easier for him to do that, just cheaper—before "no fault" divorce, he had to get his wife's agreement, which might mean higher alimony payments. This reasoning suggests that "no fault" divorce rules wouldn't change divorce rates at all. The only thing that would change was who paid whom to get the divorce. And sure enough, although there was a brief spike in divorce rates as "no fault" divorce allowed a backlog of divorces to be processed more quickly, the legislation appears to have produced no more than a blip in a strong, steady upward trend.

Instead, the divorce revolution was driven by a more fundamental economic force: the breakdown of the traditional division of labor identified by Adam Smith. At the beginning of the 20th century, housework took many hours, and only the poorest and most desperate married women had jobs. As the decades rolled past, technological change made housework less time-consuming. It became easy—and quite common—for older women to enter the workforce after their children were grown and housework was easily manageable.

Once divorce rates first began to climb, it was no surprise that they increased dramatically. There was a rationally self-reinforcing loop at work: the more people divorced, the more divorcees—that is, potential marriage partners—you could meet. That meant that it was easier to get divorced yourself and find a new spouse.
Furthermore, once divorce started to become conceivable, women knew they could no longer think of themselves as one part of an economic unit. Rationality, you will recall, is about thinking ahead and responding to incentives. Realizing that the economic unit might break up, at which point a woman who simply specialized in having children was in serious trouble, it became rational for a woman to maintain career options as divorce insurance. In the division-of-labor world of the 1950s, unhappily married women would rationally stick it out: they had few alternatives. But as more older women were finding jobs, managing their housework more quickly with the aid of washing machines and electric irons, women started to realize that there was an alternative to an unhappy marriage. Divorce was still financially tough but it was no longer economic suicide. And then the contraceptive pill came along, making women—as we have seen—more highly educated, career-minded and employer-friendly.

Did women really need career options before they could get divorced? In all but the most desperately unhappy marriages, they did. Contrary to the popular bar-room grumbles of divorced men, alimony alone doesn't take women very far financially. Fewer than half of single divorced mothers get any child support at all, and for those who do, child support is just a few thousand dollars a year, typically about one-fifth of the mother's total income. If a woman, especially a mother, was determined to get a divorce, she almost always needed to find a job. More and more women realized that they had the ability to do exactly that.

That started a second reinforcing loop—some people regard it as a vicious circle. Because divorce was conceivable, women preserved career options. But because women had career options, divorce became conceivable. It became less and less likely that a woman would become trapped in a miserable marriage out of pure economic necessity.

A close look at the statistics backs up this story. Even today, when so many women work for fun or the enjoyment of spending the cash, women tend to work more when they face a higher risk of divorce. There are several ways to guess at that higher risk: you can look with hindsight at who did get divorced and assume that the woman involved might have seen it coming beforehand; you can look at variables such as age, religion and whether parents went through a divorce; or you can ask women how happy they are with their marriages. Whichever way you slice it, women at risk of divorce are more likely to head out for work. The increase in divorce is not because of a change in the psychology of love: it is a rational response to changed incentives.

The changing incentives also altered the way couples behaved within the relationship. In states which introduced "no fault" divorce, while divorce rates did not show a lasting increase, women knew that their husbands could walk away from the marriage without having to buy their agreement with a generous side-deal. That made it riskier to make an expensive commitment to the relationship: riskier to have children, riskier to financially support a husband through school, and riskier to become a homemaker while hubby focused on his career. The economist Betsey Stevenson explored this question using a research approach that should now be familiar, looking at the timing of the new law, state by state. And she found that when states introduced "no fault" divorce and thus gave the husband an easy escape from the marriage, wives were less likely to work while their husbands went through school, but more likely to work full-time and less likely to have children. All these effects were quite large; for each decision, between five percent and ten percent of women changed their behavior as the law changed.
A young woman in the early 1970s faced a different world to that her mother lived in two decades earlier. She could see that career opportunities for women had opened up, and there were jobs available if she wanted them. She could see, too, that divorce rates were on the rise and she should not, if she was wise, simply rely on a husband to provide her with an income, because extreme division of labor was too insecure for an age of divorce. Other women her age were marrying later, meaning that there were more men to date and marriage could be postponed. To cap it all, she had access to a safe, reliable way of postponing children until she was ready to have them, meaning she could plan for a long education and several years to establish herself in a serious, high-powered career.

This analysis links divorce, the pill and women's increasing power and achievement in the workplace in a reinforcing loop. But it would be wrong to "blame" an increase in divorce rates on an increase in women's professional achievements. There is, after all, no evidence that people are more unhappy with their marriages than in 1950. The opposite is likely to be true, because when they are unhappy with their marriages they can do something about it. One influential study by economists Andrew Oswald and Jonathan Gardner finds that divorcees, unlike widows and widowers, are happier one year after the marriage ends than they were while still married.

Perhaps a more positive way to express the trend is that women's entry into high-powered careers has given them the option to get divorced if the marriage isn't working out; and the recognition that that option is important is one of the factors encouraging women's entry into high-powered careers.

That may sound a little abstract, but economists Betsey Stevenson and Justin Wolfers discovered a chilling example of the way that the increased availability of divorce empowered women. As states passed "no fault" divorce laws, women acquired a credible threat to walk out of the marriage. (The statistics suggest that many of them did not, actually, do this. But the threat is enough.) Stevenson and Wolfers show that the new laws had an unexpected—but rational—effect: by giving women an exit-option, they gave men stronger incentives to behave well inside a marriage. The result? Domestic violence fell by almost a third, and the number of women murdered by their partners fell by ten percent. Female suicide also fell. It is a reminder that the binding commitment of marriage has costs as well as benefits.

Perhaps we should celebrate divorce just a little bit more. First, we should recognize that divorce is no longer increasing. That is rational. The peak in divorce in the 1970s was not, fundamentally, caused by legal changes but by changes in the underlying economics of family life, changes which reduced the incentives to be married.

In the long run, the rational response is not for couples to marry early and marry often; it is to divorce less and marry less, too. Now that the stock of marriages has been decimated by divorce, romantic couples are moving from the boom and bust of marriage and divorce to a more stable arrangement where marriages are delayed until couples are more sure of themselves. And perhaps delayed indefinitely—two of the leading economic researchers in the field, Stevenson and Wolfers, have been a romantic couple for ten years, and remain unmarried.
While the divorce rate has been falling for three decades, it would be a shame if it fell too far. Justin Wolfers comments, "We know there exists something called an optimal divorce rate, and we're 100 percent sure it isn't zero."

The serious entry of married women into the workforce has meant that they spend a little less time baking cookies, and perhaps also that their husbands spend a little more time with the children. It has empowered them to leave marriages that are not working, making them happier and safer from abuse. It has truly been a revolution, and the price of that revolution is more divorce and less marriage. That price is very real—but it is almost certainly a price worth paying.

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