

Sex Work, Technological Unemployment and the Basic Income Guarantee

by John Danaher*

Abstract

Is sex work (specifically, prostitution) vulnerable to technological unemployment? Several authors have argued that it is. They claim that the advent of sophisticated sexual robots will lead to the displacement of human prostitutes, just as, say, the advent of sophisticated manufacturing robots have displaced many traditional forms of factory labour. But are they right? In this article, I critically assess the argument that has been made in favour of this *displacement hypothesis*. Although I grant the argument a degree of credibility, I argue that the opposing hypothesis -- that prostitution will be *resilient* to technological unemployment -- is also worth considering. Indeed, I argue that increasing levels of technological unemployment in other fields may well drive more people into the sex work industry. Furthermore, I argue that no matter which hypothesis you prefer -- displacement or resilience -- you can make a good argument for the necessity of a basic income guarantee, either as an obvious way to correct for the precarity of sex work, or as a way to disincentivise those who may be drawn to prostitution.

Keywords: Prostitution, Sex Work, Sex Robots, Technological Unemployment; Basic Income

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1. Introduction

Debates about technological unemployment typically focus on the displacement of mainstream, socially accepted forms of human labour. Such displacement often generates sympathy and ethical concern for the displaced workers. But what about the effects of technology on less accepted forms of human labour? In particular, what about the effects of technology on sex work? For a long time, human beings have used technological artifacts for sexual stimulation; and for an equally long time (if not longer) they have engaged the services of (human) sex workers. Could a day ever come when the former displace the latter? And what ethical/social implications might that have? This article addresses these questions in two parts.

First, I consider the “Displacement Hypothesis” and its alternatives. The displacement hypothesis is the claim that one day sophisticated sexual robots or artificial intelligences will displace human sex workers (specifically prostitutes), in much the same way as manufacturing robots have replaced their human equivalents. While such a claim might seem like the purest science fiction, it has been defended (or, at least, seriously suggested) by several authors. They base their defence of the hypothesis on a combination of technological predictions and demand-based considerations, *i.e.* on factors that motivate those who purchase sexual services. Roughly, the argument is that if one assumes that sex robots will become increasingly human-like in appearance and function, and that such robots will have advantages over their human equivalents, one can also assume that people will switch their demand from human prostitutes to robots. While this hypothesis has a degree of credibility, I try to argue for an alternative, something I call the “Resiliency Hypothesis”. According to this hypothesis, sex work may be one of the industries that is resilient to technological unemployment. I defend this on two main grounds. The first, and obvious ground, follows defenders of the displacement hypothesis in focusing on demand-based considerations and holds that people are likely to prefer human sex workers to sex robots. The second, less obvious ground, focuses on supply-side considerations and holds that technological unemployment in other industries is likely to increase the supply of human sex workers. Although I certainly wouldn’t bet my life on the resiliency hypothesis, I argue that it is a serious possibility, worth considering in addition to the displacement hypothesis.

Second, I address the implications of all this for arguments in favour of the basic income. I argue that no matter which hypothesis you prefer — displacement or

resiliency — each provides fertile grounds for favouring the introduction of a basic income. If one favours displacement, then one has more evidence for the precarity of labour and for the likelihood of increasing capital-labour inequalities. These could best be addressed by the introduction of an unconditional basic income. Contrariwise, if one favours resiliency, two arguments present themselves. The first holds that if we wish to discourage people from entering into sex work, an unconditional basic income might be the best way to do that; the second holds that even if one has no qualms about sex work itself, the failure to *normalise* sex work in most countries (even when it has been decriminalised) provides grounds for favouring a basic income.

Before I defend these views, however, I want to briefly explain what I mean by the term “sex robots”, and consider the different forms that sex robots could take.

2. What are sex robots?

As I mentioned in the introduction, people have long been using artifacts for sexual stimulation.¹ The uses and purposes have varied. Sometimes the artifacts are used for religious or therapeutic purposes; sometimes they are used as masturbatory aids; and sometimes they are used to complement or enhance ordinary sexual congress between human partners. The variety of artifacts used for these purposes — from vibrators to blow-up dolls — is impressive, and although I have no intention of listing them all for the reader’s delectation, we need to have some sense of what a “sex robot” is, and how it might differ from other sex artifacts, if we are going to understand the arguments about technological unemployment that are discussed below.

For the purposes of this article, I will define a sex robot as any artifact that is used for sexual stimulation with the following three properties: (i) a humanoid form, (ii) the ability to move in a human-like fashion, and (iii) some degree of artificial intelligence (i.e. some ability to interpret and respond to signals in its environment). Such robots could exist in a genuine physical form (hardware), or they could be virtual (provided there is some way for the virtual form to generate sexual stimulation). As defined, a sex robot is significantly different from many traditional sexual artifacts, which often do not have a humanoid form or the ability to move, or if they do tend not to have any degree of artificial intelligence.

Sex robots can be more or less human-like in nature, with the degree of human-likeness being a function of the three properties mentioned in the previous paragraph.ⁱⁱ As it currently stands, there are sex robots in existence with minimal degrees of human-likeness. For example, Roxxy, billed by its makers as the world's first sex robot,ⁱⁱⁱ is human-like in appearance and touch, and comes pre-programmed with a set of responses to external stimuli.^{iv} Videos of Roxxy are easily located online and clearly illustrate that the degree of human-likeness is, at this stage, quite crude.^v Still, it is an indication of where the technology is going, and when one appreciates that there are more impressive developments in human-like movement and intelligence, one can imagine future sex robots being considerably more human-like in nature.

With future developments in mind, it is worth drawing one important distinction between possible forms of sex robot. The distinction is between sex robots that can “pass”^{vi} as human, and those that cannot. A robot that can pass as human is one that, at least for the duration of sexual contact, cannot be distinguished from an ordinary human partner.^{vii} For the most part, the arguments that I make below assume that robots will not be able to pass as human for a long time, or that if they do, preferences for human partners will create a powerful incentive to prove whether they are non-human prior to sexual contact.

3. Displacement versus Resilience

Technology and technological innovation can have a profound impact on employment patterns. In many cases, the impact is a positive one: technology can increase productivity and economic growth, and create new and exciting employment opportunities.^{viii} Nevertheless, the impact can also be negative, as particular groups of workers find that their form of labour is being displaced by technological analogues. This has happened most radically in the manufacturing industries, where great swathes of human labour have been replaced by tireless, more precise, and more efficient robots. It is also increasingly a feature of service industries, with, for example, automated customer carelines, self-service checkouts and the like becoming more and more prominent. Still, certain forms of labour have displayed resiliency, and there are niche markets for products and services that are made or provided purely by human hands.

As long as we can all find alternative employment opportunities, technological unemployment might be boon. It can take humans out of dull and unrewarding jobs,^{ix} and put them into more engaging and intrinsically satisfying forms of work. However, we cannot afford to be too complacent. Recent reports suggest that more and more jobs, including the highly skilled, intrinsically rewarding ones that we seem to want, are at risk of technological unemployment.^x How much resiliency is really out there and where does sex work fit within this matrix?

In the remainder of this section, I look at the technological unemployment debate as it pertains to prostitution. Although not always socially accepted, prostitution is a prevalent form of human labour, and the development of sophisticated sex robots *prima facie* puts prostitutes at risk of technological unemployment. The question is whether this risk is serious or not.

3.1 - The Displacement Hypothesis

First, let us define a hypothesis for our consideration:

Displacement Hypothesis: Prostitution will be displaced by sex robots, much as other forms of human labour have been displaced by technological analogues.

Some people take the displacement hypothesis seriously. Yeoman and Mars (2012), for instance, argue for a possible future in which the Amsterdam sex industry is taken over by “android prostitutes”. Similarly, David Levy argues that prostitutes are at serious risk of being displaced by sophisticated sex robots, and that the ethical and social implications of this displacement need to be addressed (Levy 2007 and 2012).

But is there a credible argument in defence of the displacement hypothesis? The answer would appear to be “yes”. The argument is based primarily on demand-based considerations, although also some supply-based ones apply too. Extrapolating from the work by Levy, Yeoman and Mars, we find that there are two key theses underlying this argument:

The Transference Thesis: All the factors driving demand for human prostitutes can be transferred over to sex robots, *i.e.* the fact that there is demand for the former suggests that there will also be demand for the latter.

The Advantages Thesis: Sex robots will have significant advantages over human prostitutes.

When coupled with some basic decision theoretical principles about what causes people to demand or supply certain things in preference to others, these two theses can make a decent case for the displacement hypothesis.

Let us look at the transference thesis first. There has been, and presumably always will be, a healthy demand for sex among human beings. Innate biological urges provide a reasonably consistent baseline of demand which can be accentuated in certain cultural milieus.^{xi} For instance, one could argue that the level of demand is accentuated nowadays thanks to the increasingly casual and taboo-free attitude towards sex in many Western societies. The factors influencing the demand for prostitution are a subset of the factors influencing the demand for sex in general.^{xii} There have been many studies of these factors and many attempts to categorise them.^{xiii} In his defence of the transference thesis, Levy breaks the factors into four main categories.^{xiv} For ease of analysis I will follow suit, safe in the knowledge that his categorisation is broadly consistent with the categorisations proffered by other authors.^{xv}

The first factor influencing the demand for prostitution is the so-called *myth of mutuality* (Bernstein 2007): clients seek out prostitutes because they think they can obtain the kind of emotional bond with them that is typically associated with sexual relationships. Prostitutes are (sometimes) willing to facilitate this fantasy. The second factor influencing the demand for prostitution is the desire for sexual variety, both in terms of the number and type of sexual partners (McKeganey and Barnard 1996; Mansson 2006), and the type of sexual act. For instance, research suggests that the availability of oral sex is an important factor for many men who frequent prostitutes (Monto 2001; Perkins 1999). That said, the significance of this factor dissipates as the cultural taboos and norms associated with oral sex change.^{xvi} The third factor influencing demand for prostitution is the appeal of sex that is free from the typical emotional and social constraints and complications.^{xvii} And the fourth factor influencing

demand is a lack of sexual success in ordinary life, where this lack of success can itself be caused by numerous factors, including social isolation, disability, long working hours, and age (Campbell 1998; Warr and Pyett 1999; Sanders 2007 & 2008).

The gist of the transference thesis is that each of these factors would carry over to sex robots; in other words, that sex robots are credible substitutes for human prostitutes. Levy is the one who makes this case most vigorously. The strength of this case is dependent on the state of the technology. It is relatively easy to see how certain factors would transfer over; less easy to see how others would, without a significant improvement in the technology. For example, it is relatively easy to see how three of the factors — lack of sexual success, desire for sexual variety, and freedom from constraint and complication — could transfer over to sex robots. Indeed, we already see sex robot manufacturers catering to these demand-based factors. Roxxy, who was mentioned earlier, comes pre-programmed with five different personalities, ranging from the prim and proper to the prurient and kinky.^{xviii} These personalities help cater to the demand for sexual variety. We can also assume, plausibly, that sex robots can be made available to those who experience a lack of sexual success, and that sex with such robots can be free from all complication and constraint. What is more difficult to see is whether emotional bonding will be possible with sex robots. It is certainly true that people form emotional attachments to artifacts and artificial intelligences — Levy (2007) and Turkle (2011) make a good case for this — but the current technology is crude, and the reciprocity of the exchanges extremely limited. Much more sophistication will be required before sex robots become true competitors to humans along this domain. Still, the possibility of transference of even this factor must be acknowledged. The result is that there is a plausible case for the transference thesis.

But, of course, the case for displacement does not rest on the transference thesis alone. It is only when this thesis is combined with the advantages thesis that we begin to see how sex robots may come to displace ordinary human prostitutes. It is only if sex robots will be demanded (and supplied) in preference to human prostitutes that displacement is likely to take place. So what advantages do sex robots have over humans?

We can start with *legal advantages*. In many countries, prostitution is legally prohibited, thereby putting both the prostitute and client at risk of legal sanction; the use

of sex robots is typically not subject to legal sanction. Given these conditions, we might expect sex robots to be preferred to prostitutes: they can satisfy sexual needs without opening the prostitute, client, pimp, or brothel owner up to the risk of legal sanction. Indeed, Levy notes that legal advantages of this sort have already encouraged suppliers in Japan and Korea to rent out sex dolls to clients in order to avoid legal penalties (Levy 2012). A similar argument could be made on the grounds that sex robots can cater to certain, currently illegal, sexual deviancies. However, it needs to be stressed that the rectitude and likelihood of robotic (or “virtual”) forms of sexual deviance being made legal is highly questionable.^{xix}

There are also *ethical advantages*. Many people are concerned about the ethics of human prostitution, particularly where it is suspected to involve trafficking or enforced sexual slavery. Provided that sex robots do not reach the level of sophistication needed for artificial personhood (in the morally thick sense of “personhood”),^{xx} the same sorts of ethical concern do not arise.^{xxi}

Then there are the *health risk advantages*. Yeoman and Mars (2012) cite the risk of contracting STDs, in particular HIV/AIDs, from human prostitutes as a possible advantage of robots over humans. This, however, must be tempered by the observation that if sex robots are reused by multiple clients, poor sanitation could also carry a risk of infection.

Finally, there are *advantages of flexibility and production*. As mentioned above, robots can be programmed and designed to suit the whims of their users. They may even, if the technology is realisable, become better at developing emotional bonds with their clients: they won’t need to “fake it” in the same way as human prostitutes. More generally, there is the fact that the demand for prostitution is increasing, perhaps at a rate that cannot be met by human workers,^{xxii} either because they are unable or unwilling to do so. If sex robots can be produced en masse, then they can be made to meet the increasing demand.

Collectively, these make a decent case for the advantages thesis and when combined with the transference thesis, it seems like we have a reasonably compelling case for the displacement hypothesis. Human prostitutes may, indeed, be at a serious risk of technological unemployment.

3.2 - *The Resiliency Hypothesis*

Or are they? Although, I grant the credibility of the displacement hypothesis, I think there is a compelling case for the alternative hypothesis too. I want to explore that case next. We start with a definition of the hypothesis:

The Resiliency Hypothesis: Prostitution is likely to be resilient to technological unemployment, *i.e.* demand for and supply of human sexual labour is likely to remain competitive in the face of sex robots.

Many of those who have written about sex robots and the impact they may have on society, have tended to ignore the resiliency hypothesis. This may be because they think it represents a complacent status quo, and that the displacement hypothesis is the more interesting, novel claim. I don't quite see it the same way. I think these authors have been too enamoured with demand-based considerations (why people have sex with prostitutes) and their transference over to sex robots, missing out on the equally important supply-based considerations (why people become prostitutes) and their relationship to more general employment patterns. If we pay greater attention to these considerations, a more interesting social picture of the future emerges. One that we would be well-advised to anticipate.

The case for the resiliency hypothesis rests on two key theses:

The Human Preference Thesis: *Ceteris Paribus*, if given the choice between sex with a human prostitute or a robot, many (if not most) humans will prefer sex with a human prostitute.

The Increased Supply Thesis: Technological unemployment in other industries is likely to increase the supply of human prostitutes.

Combined, the two theses lead us to conclude that there will be a demonstrable preference for human prostitutes and an ample supply of human prostitutes to meet that preference. Thus, the development of sophisticated sex robots is unlikely to make a significant dent in the market for prostitution: the human market will be resilient to

competition from the robots. There are, however, problems with this basic argument. The “*ceteris paribus*” clause in the first thesis is in recognition of the fact that, if we follow the logic of the advantages thesis, all else is not equal between humans and robots; on the contrary, robots are said to have advantages over human prostitutes. Therefore, a key part of the defence of the resiliency hypothesis will be a rebuttal of the advantages thesis. This will emerge as we consider the arguments in favour of the two theses.

Let us start with the human preference thesis. A case can be made for this from common sense and intuition. If I were presented with the choice between sex with a (willing) human partner or a robot, I’m pretty sure I would prefer the former to the latter. Though sexual activity comes in many forms, there is a core type of sexual contact is a deeply *human, interpersonal* and *embodied* activity. The desirability of this form of sexual contact is not simply a function of sexual excitement or orgasm. After all, people can achieve sexual excitement and orgasm through solitary sexual activity. There is something about intimate contact between *human persons* that makes these non-solitary sexual acts especially appealing. The same won’t be true of sex with robots.

Of course, there are responses to this intuitive argument. You could argue that I am not comparing like with like; that the human preference might arise in the case of ordinary sexual relationships but not in the case of commercialised sexual relationships. In other words, people would, all else being equal, prefer to have a sexual relationship with a human than with a robot, but would not necessarily prefer a human partner when it comes to commercialised sexual activity. I don’t believe this response is credible. Several of the factors motivating demand for prostitution are derived from ordinary sexual relationships (mutuality; lack of success), and even in those cases where it differs, there may be reasons for thinking human partners would still be preferred. More on this in a moment.

Another response would hold that sex with a robot could give rise to the same kind of person-to-person contact because robots could be persons (or close enough to “pass” as persons). Thus, even though the contact is not human-to-human, it still achieves the right kind of intimacy. There are two replies to this. First, we still have some distance to go before this level of sophistication is achieved: the human preference may be sustained up until that point. Second, even if robots did obtain that level of

sophistication, it is likely that the human concern for the ontological history of certain objects would maintain the preference for human partners. We certainly see this in other areas. For example, the preference for paintings that are painted by the right person over and above perfect replicas; or clothes from the right designer over cheaper but identical equivalents;^{xxiii} or, more controversially and more closely linked to sexual practice, the desire to know the gender history of one's partners.^{xxiv} To put it bluntly, humans care about where things come from, not just their extant properties. And no matter how you look at it, robots won't have the right ontological history.

The case for the human preference thesis doesn't just rest on intuition and commonsense. A Huffington Post/Yougov poll conducted in early 2013 asked people whether they would be willing to have sex with a robot. Only 9% of those polled said they would, with 81% saying they would not, and 10% saying they were unsure.^{xxv} Although that doesn't quite demonstrate human preference, it does at least show general reluctance to have sex with a robot. Still, the results of the survey must be interpreted critically: people may not be willing to admit to things they would actually do (even in an anonymous poll), and the question did not carefully define what was meant the term "sex robot".

Another intriguing bit of evidence for the human preference thesis comes from *uncanny valley* effect. First discussed by robotics pioneer Masahiro Moti in 1971, the uncanny valley refers to the apparent eeriness or unease people experience when looking at or interacting with an artificial object that is too human-like. The suggestion is that this can elicit a strong disgust response which, if it applied to sex robots, would obviously lend support to the human preference thesis. For a long time, the evidence for the uncanny valley effect was entirely anecdotal, based primarily on reports from people viewing computer animations that were human-like. Perhaps the most infamous example comes from audience responses to the characters in Robert Zemeckis's *Polar Express* movie. More recently, experimental support for the effect has emerged (MacDorman and Ishiguro 2006; MacDorman, K.F. 2006; Seyama, J., & Nagayama, R. S. 2007; Saygin, A. P., Chaminade, T., Ishiguro, Driver & Frith 2011; though cf. MacDorman, Green, Ho, & Koch 2009), with some studies even suggesting that the effect holds for chimpanzees (Steckenfinger and Ghazanfar 2009). But the evidence from these experiments is complex and contested. In one of the most recent studies, Burleigh et al. (2013) suggest that the effect, if it exists, may not be due to the degree of

human-likeness *per se*, but due to the fact that the person viewing or interacting with the artificial agent is experiencing a kind of category-conflict in their perceptual faculties. In other words, they are perceiving something that seems to belong to two different categories at the same time and this conflict creates a strong sense of dissonance or discomfort. They may be right, but this would, of course, still lend support to the human preference thesis.

Critics of my argument may jump in here and suggest that I am ignoring one critical point: the uncanny valley is just that, *a valley*, not a persistent phenomenon. In other words, it is only a dip in attractiveness that occurs before more complete human-likeness is achieved. For what it's worth, I think this assessment is premature. As originally described by Mori, the phenomenon was indeed a mere dip in attractiveness, but experimental studies may prove this to be mistaken: it could be that the category-conflict problem persists as long as the person knows that the object they are interacting with is a robot, not a human. Furthermore, even if it were only a dip, the dip could persist for a considerable period of time in the development of sex robots. During this period of time, the human preference could be sustained and with it the resiliency hypothesis.

In sum, there is a case to be made for the human preference thesis. The case rests on a mixture of commonsense, intuition and empirical evidence. I think the cumulative weight of these considerations is sufficient, but even if you do not, bear in mind that the human preference thesis is quite modest in its claims. It is not suggested that human sex partners will always and everywhere be preferred to robot ones, just that they will tend to be, all else being equal.

Moving on then to the increased supply thesis. In many respects, this is the more interesting thesis, and it is the one that switches our attention away from factors affecting the demand for prostitution, and onto factors affecting the supply. One the problems with the human preference argument, by itself, is that it doesn't say anything about the overall supply of human prostitution. It's all well and good saying that a human preference will be maintained, but if there aren't enough human prostitutes to meet the available demand people may well be likely to seek out the comfort of a sex robot.^{xxvi} This is where the increased supply thesis comes into play. It claims that the supply of human prostitution is likely to be able to match demand.

The case for the increased supply thesis rests on four premises, which are worth stating explicitly here:

- (1) An increasing number of jobs, including highly skilled jobs, are vulnerable to technological employment.
- (2) If an increasing number of jobs are vulnerable to technological unemployment, people will be forced to seek other forms of employment (all else being equal).
- (3) When making decisions about which form of employment to seek, people are likely to be attracted to forms of employment: (i) in which there is a preference for human labour over robotic labour; (ii) with low barriers to entry; and (iii) which are comparatively well-paid.
- (4) Prostitution satisfies all three of these conditions (i) - (iii).
- (5) Therefore, there is likely to be an increased supply of human prostitution.

What can be said in favour of these four premises?

Premise (1) is endorsed by an increasing number of commentators. The case for it rests, in part, on the extrapolation from current trends, and, in part, on some predictive futurology. One of the most alarming economic trends in the last half century has been the increasing labour-capital income disparity (International Labour Organisation, 2013; Fleck, Glaser, and Sprague 2011). Several economists, perhaps most notably Paul Krugman, have attributed this to the increasing role of technology (capital) in replacing human labour (Krugman 2012 & 2013). If this trend continues, we can expect further technological unemployment. And it is not hard to imagine that this trend will continue and will affect highly skilled forms labour too. We already see this happening with the advent of driverless cars, military drones, trading algorithms, legal research algorithms, and automated drug delivery and monitoring systems.^{xxvii} Trends of this sort have recently led researchers at the Oxford Martin School to predict that up to half of all jobs in the U.S. are at risk of technological unemployment in the next 20 years.^{xxviii} This is an alarming prediction and would certainly provide support for the first premise.

Premise (2) looks like a reasonable inference. Given the pressure to earn an income in order to meet basic needs and to live a life of comfort and well-being, it stands to reason that those who become technologically unemployed would seek other forms of employment. That said, the existence of something like an unconditional basic income guarantee might be a game-changer with respect to the need for employment. This is why premise (2) includes the “all else being equal” clause. Premise (3) is similar to premise (2) in that it looks like a reasonable inference from current human incentive patterns. If I have recently been technologically unemployed, and if an increasing number of high skilled jobs are vulnerable to such unemployment, I’m most likely to seek out work that is less vulnerable (if not impervious) to displacement, that requires little or no re-training or upskilling, and that is well-paid (relative to all the other options available to me).

That leaves us with premise (4). Is it defensible? I have already considered the case for the human preference, so that leaves us with the other two conditions. Condition (ii) seems relatively easy to defend: one can set-up shop as a prostitute with ease, even taking into consideration legal bans and prohibitions. Certainly, there is no advanced training or credentialing that is required (yet). Condition (iii) seems to be confirmed by various empirical studies of prostitutes. When compared to other available forms of work (usually low-skill, manual labour), prostitutes are comparatively well-paid. Earning potential within the “industry” varies greatly, of course, with high-end prostitutes (escorts, call-girls etc.) often earning large sums of money per assignation,^{xxix} while street-walkers earn relatively less. Still, even at the lower-end of the industry, studies have shown that prostitutes can expect to earn multiples of the minimum wage.^{xxx} Indeed, economists expend considerable energies explaining why it is that prostitutes are comparatively well-paid. Some think it arises from the stigma of sex work (Della Giusta, Tommaso and Strom 2009), some from the high risk nature of the work (Cameron 2002),^{xxxi} and some from the costs of forgoing marriage or other forms of long-term relationship (Edlund and Korn 2002). The particular explanations do not matter much here (though I tend to favour the stigma hypothesis).^{xxxii} All that matters is that the evidence points to prostitution being comparatively well-paid and that the factors that make it comparatively well-paid can be expected remain in place for the foreseeable future. If this is right, then it looks like conditions (i) - (iii) are satisfied, and the case for the increased supply thesis is thereby defended.

When the increased supply thesis is combined with the human preference thesis, we provide a reasonable grounding for the resiliency thesis. The picture that emerges is the following: People prefer to have sex with humans, and in the future more people will be willing to supply human sexual labour, being driven to it by increasing levels of technological unemployment in other industries. This picture is very different from that being promoted by proponents of the displacement hypothesis.

But is it a credible picture? As you'll recall from earlier, I said that the human preference is only like to hold up if *all else is equal*. But as we saw in the previous section, sex robots are said to have decisive advantages over human prostitutes, advantages that will make them more attractive in commercial sexual transactions. What can be said in response? Several things. When it comes to the legal advantages of sex robots over humans, we can highlight the fact that legal bans have not, historically, dissuaded people from becoming prostitutes. If the economic pressures are sufficient, they may well trump concerns about being arrested or punished, as they have done for many people in the past. Furthermore, many (Western) countries have now relaxed or decriminalised prostitution. This trend could well continue, particularly if more and more people are forced into sex work by technological unemployment. In other words, there could be a positive feedback cycle: as more people enter the industry, the pressure to remove the legal barriers to entry may increase. When it comes to ethical advantages, we can again note that these have not dissuaded people historically from engaging the services of prostitutes, and, in any event, ethical attitudes have been shifting thanks to increasing acceptance of "casual" sex. Finally, when it comes to health risk advantages and advantages in terms of flexibility and production, the response is straightforward: human prostitutes will adapt in order to maintain their advantage over robot competitors. Thus, they will adopt safe sex practices, if that is what clients demand.^{xxxiii} Similarly, they will cater to demands for variety and emotional connection by either training themselves to adopt different personalities, engage in different sexual practices, or to fake emotional connections. Indeed, there is plenty of evidence to suggest that this adaptive behaviour already takes place in (human) prostitution markets.^{xxxiv}

There is another problem with the argument though. To this point it has been assumed that the demand for human prostitution will remain robust in the future, but that assumption is problematic if we are expecting increasing levels of technological

unemployment.^{xxxv} How are people going to afford prostitution if they are not employed elsewhere? Of course, this problem is intimately bound-up with the general problem of technological unemployment: if capital (in this case robotics) takes an ever larger share of the total income, wealth will tend to be concentrated among the capital owners. This may negatively affect demand for many goods and services, including, demand for robot sex workers. So it's not clear that this point tips the balance in favour of the displacement hypothesis. It may, if robot sex workers are considerably cheaper than human sex workers, but again we can expect human sex workers to adapt to the competitive pressures by lowering prices *to at least some degree* and thereby maintain the competitive advantage given by the human preference.

In summary, I believe that the preference for human sex partners could be a significant factor when it comes to the future of human prostitution, despite the alleged advantages of sex robots, and when it is coupled with the increased supply thesis it makes a serious case for the resiliency hypothesis.

4. Prostitution and the Basic Income Guarantee

Where does that leave us? The arguments in the preceding section have said nothing about the social and ethical implications of displacement and resiliency; they have simply considered which of the two hypotheses is more likely, given what we know about the supply and demand of sexual labour and given some plausible predictions. In this final section, I will move on to consider some of the ethical and social impact, but I do in a focused way. I will remain agnostic about the ethics of prostitution and robot sex. In other words, I will not assume that it is right or wrong to become a prostitute, or to have sex with prostitutes or robots; I will assume that it could be either. What I will focus on instead is the case for a basic income guarantee and how it may be affected by the displacement and resiliency hypotheses. My comments here will be general and programmatic, gesturing at future developments in the debate rather than offering a complete defence of any particular position.

Let me first say a word or two about the unconditional basic income and the case that can be made on its behalf.^{xxxvi} The unconditional basic income guarantee is radical proposal for reforming the way in which income is distributed. The proposal is defined by the Basic Income Earth Network^{xxxvii} in the following manner:^{xxxviii}

Basic Income Proposal: A basic income is an income unconditionally granted to all on an individual basis, without means test or work requirement. It is a form of minimum income guarantee that differs from those that now exist in various European countries in three important ways: (i) it is paid to individuals rather than households; (ii) it is paid irrespective of any income from other sources; and (iii) it is paid without requiring the performance of any work or the willingness to accept a job if offered.

This is the definition I will work with for the remainder of this discussion. This definition leaves many important details to be worked out, including whether the income is paid to adults and citizens only, or whether it is paid to a broader set of people, and also who exactly pays the income (the state, some supranational body, or other public institution?). Nevertheless, it captures the essence of the proposal.

The basic income proposal can be defended on a number of ethical grounds. Perhaps the most general and persuasive argument for the proposal is to work from core liberal assumptions about freedom and non-domination.^{xxxix} In other words, to claim that every human person is entitled to a certain level of freedom, non-interference and/or non-domination, and that this level of freedom, non-interference and/or non-domination can only be achieved if there is an unconditional basic income grant. Arguments of this sort work from the essential moral properties of human agency to conclusions about the appropriate shape of human society. This means they are persuasive across most, if not all, human societies. One difficulty with these arguments — at least from the perspective of the current article — is that they are not particularly sensitive to claims about the future direction of human society. After all, the basic moral properties of human agency are relatively fixed over time and so they will tend to justify the same scheme of distribution no matter what future employment patterns might be.

Consequentialist and egalitarian arguments for the basic income are different. For the egalitarian, the goal is to avoid unfair imbalances in the distribution of wealth. Imbalances are clearly something that could arise and vary over time. Indeed, it is not hard to use technological unemployment to make an egalitarian case for the basic income. If we take the economists' point that technological unemployment leads to greater capital-labour income inequalities, we can easily see how wealth can become

concentrated in the hands of the relatively few. The basic income guarantee would be a way to redress the balance, and it would have advantages over other redistributive programmes in respect of its simplicity and ease of implementation.^{x1}

Similarly, for the consequentialist, the goal will be to maximise or optimise some set of goods, such as the general level of well-being. And again, things like the general level of well-being could vary over time. Indeed, it is not hard to use technological unemployment to make a consequentialist argument for the basic income. Assume, for instance, that we wish to maximise the total amount of well-being and that the total amount of well-being tracks the total amount of consumption. One problem with the concentration of income in the hands of relatively few capital owners is that it is likely to lead to a sub-optimal level of consumption. Those with a lot of wealth are likely to save rather than consume. Redistribution via an unconditional income might be a way to improve things in this regard: it keeps the greasy wheels of capitalism turning, by fueling more consumer demand. Just to be clear, this is only one consequentialist argument for the basic income, which works with a particular set of assumptions about what is worth maximising and how best to go about it. Other consequentialist arguments for the basic income are possible too.

Given their sensitivity to historical and future employment patterns, egalitarian and consequentialist arguments for the basic income would seem to be more relevant to the current debate.

So what then do these consequentialist and egalitarian arguments have to say about prostitution, technological unemployment and the basic income? Quite a lot as it happens. I would suggest that no matter which of the two hypotheses outlined above is favoured — displacement or resiliency — we can make a pretty good case for the basic income guarantee if we work from egalitarian or consequentialist principles.

Assume, in the first instance, that the displacement hypothesis is true, *i.e.* that Levy and the others are right and that human prostitutes are vulnerable to technological unemployment. In that case we have further evidence for an increased capital-labour income inequality, which strengthens the egalitarian argument for a basic income. Similarly, human prostitutes are already a particularly vulnerable and precarious sector of the working population, with many people driven into it through economic

desperation. It may be right and proper for us to be especially concerned about the effects of technological unemployment on them, and to do our utmost to minimise the suffering they may be forced to endure. But, of course, many prostitutes are unwilling to publicly disclose their participation in the sex work industry and it is consequently difficult to target those who may be affected. A basic income guarantee may be the most effective way to protect their well-being.

Assume, in the second instance, that the resiliency hypothesis is true, *i.e.* that human sexual labour will be preferred to robot sexual labour, and that we can expect the supply of the former to increase thanks to other forms of technological unemployment. In that case, two possibilities present themselves, depending on the ethical mood with which we approach prostitution. If we think prostitution is ethically problematic, and that on the whole it would be better if people didn't supply sexual labour, then we have an obvious argument for the basic income guarantee. The increased supply of sexual labour will be driven primarily by the economic needs of the workers. If we can meet those needs via an income grant, we should be able to discourage people from supplying sexual labour. A basic income guarantee would be the preferred method for doing this because, again, it would be difficult to identify those who may be inclined to supply sexual labour before the event.

If we think prostitution is ethically permissible, the case for the basic income is less easy to see. At first glance, we may even be driven to the opposite conclusion. If prostitution is one of the few industries that is resilient to technological unemployment, we might try to encourage people to join its ranks. But there is still an argument for the basic income to be made here. For even if we think prostitution is perfectly acceptable, and so have no desire to discourage people from becoming prostitutes, it could be that sex work remains so precarious that a basic income guarantee would improve outcomes for the workers. Cruz has defended this view in a recent paper (Cruz 2013).^{xli} As she points out, even in jurisdictions where there is considerable mainstreaming of prostitution (and sex work more generally), there is not always a corresponding increase in the legal protection of prostitutes. Prostitutes are typically self-employed, even when working at a brothel owned by a third party, and consequently don't have access to the same employment rights and protections as other workers. There are good reasons for this: sexual autonomy is an important virtue (Anderson 2002), and prostitutes don't want to have an employer exercising too much control over their labour (Cruz 2013,

479). Furthermore, social stigmas and norms mean that sexual labour tends to be viewed as a unique and exceptional form of human labour, not something that easily sits within the traditional framework of legal rights and protections. The result is that prostitutes face difficulties in protecting both themselves and their income streams. So, if technological unemployment in other industries is likely to drive more people into prostitution, and if we think prostitution is an acceptable form of human labour, we still have a case for the basic income guarantee: the *failure to fully normalise sex work* in countries in which it has been tried suggests that a more robust form of income protection is desirable.

5. Conclusion

Increasing levels of technological unemployment pose a problem across a range of industries. In this article, I have considered the problem it poses for sex workers, in particular prostitutes. Several authors have recently argued that prostitution is just as vulnerable to technological unemployment as other forms of human labour. Although I accept they have a reasonable case, and, indeed, I have tried to strengthen it for them, I think an equally reasonable case can be made for the opposing view. Prostitution could well be one of the few forms of human labour that is likely to remain resilient in the face of technological unemployment. In any event, no matter which hypothesis is preferred, the case for a basic income guarantee can be bolstered by looking into the question of sex work and technological unemployment. Until now, this has been relatively neglected area of scholarship. With this paper I hope to prompt further reflection and inquiry into this important topic.

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- ⁱ Levy 2007, chapter 7 looks at some of the history; See also Maines 2001, for a study which focuses more on the role of the vibrator in the treatment of female hysteria.
- ⁱⁱ Cf. Whitby 2012. Whitby argues that human-likeness is a function of appearance, behaviour and the kinds of tasks performed by the robot.
- ⁱⁱⁱ See: <http://www.truecompanion.com/> visited on 2/11/13. Roxxy was unveiled at the 2010 AVN Expo in Las Vegas to a degree of ridicule. See: <http://www.thetechherald.com/articles/Roxxxy-sex-doll-is-world-s-first-TrueCompanion/8918/>, visited on 2/11/13. Interestingly, the manufacturers originally specialised in robot caregivers for the elderly, and Roxxy's creator, Douglas Hines, claims that the robot can be a companion, not just a sex toy.
- ^{iv} To be more precise, the robot is programmed with certain personality types, described by the manufacturer as "Frigid Farah", "Wild Wendy", "S&M Susan" and so on. See: <http://www.truecompanion.com/shop/pages/FAQ.html>, visited 2/11/13
- ^v For example, see <http://www.youtube.com/watch?v=2MeOqI77dTQ> (visited 1/12/13)
- ^{vi} The term comes from sociology and refers to the ability of people who are not members of a particular social group to pass as members of that group.
- ^{vii} A sex robot that can "pass" as a human sex worker would not necessarily pass the Turing Test (the traditional standard in the field for determining human-level artificial intelligence). This is because the conversational interactions between a human sex worker and client may not reach the level of complexity demanded by the Turing Test. Of course, this is only true for short-term, non emotional interactions. Longer term, emotionally significant interactions between human and sex robot probably would require Turing-level complexity.
- ^{viii} Maynard Keynes, among many others, espoused this view. See Maynard Keynes 1966 pp 353-378. In this essay, Keynes refers to technological unemployment as a "temporary maladjustment".
- ^{ix} Russell 2004 argued, essentially, for this thesis in his essay "In Praise of Idleness".
- ^x A classic doom-mongering text from the mid-90s was Rifkin 1997. Interestingly, Rifkin's book assumed the persistent demand for highly skilled, knowledge intensive forms of human labour. Recent and future developments in artificial intelligence would put even these forms of labour at risk. See: Frey and Osborne 2013; and Brynjolfsson and McAfee 2011.
- ^{xi} Sanders, T. 2008 notes that the demand for prostitution, in particular, is driven by "push" factors, which are internal to the individual, and "pull" factors which are situated in the broader cultural and social milieu.
- ^{xii} One obvious disjunction between the two sets would appear to be procreation. People can and do have sex with another for procreative purposes, but it is rare for this to be the motivation for having sex with prostitutes.
- ^{xiii} For a general overview of the research in this area, see Sanders, O'Neill, and Pitcher 2009, pp. 79-82.
- ^{xiv} Levy 2007, chapter 6. Technically, Levy only *names* three distinct factors, but I take it that the fourth ("the myth of mutuality") is implicit in the text.
- ^{xv} Compare: Levy 2007, chapter 6 with Sanders, O'Neill and Pitcher 2009, chapter 5, pp. 79-82.
- ^{xvi} Levitt and Dubner 2010, chapter 1 presents some interesting data on the fall in the cost of oral sex over the course of the 20th Century, suggesting that it no longer carries the same "taboo" tax or significance it once did.
- ^{xvii} McKeganey and Barnard 1996 include this among their five motivational factors; Plumridge et al., 1999, note that dissatisfaction with typical relationship-demands is a factor in the demand for prostitution; and Sanders 2008 also notes that unease about traditional dating norms drives some men to buy sex.
- ^{xviii} See: <http://www.truecompanion.com/shop/pages/FAQ.html>, visited 2/11/13
- ^{xix} The debate about the ethics of virtual paedophilia is instructive in this regard. There is widespread objection to its legalization, despite the fact that no "person" would seem to be directly harmed in its making. See Luck 2009 for a discussion.
- ^{xx} Even if they do, there are some who think that robot slaves are not as ethically problematic as human slaves. See Petersen 2012.
- ^{xxi} Yeoman and Mars (2012) specifically cite concerns about trafficking as one reason for thinking that sex robots may come to dominate the sex industry.
- ^{xxii} Again, this is cited as a factor by Yeoman and Mars (2012). The available data does seem to support the view that demand for prostitution is on the increase. See, for example, Ward et al. 2005.
- ^{xxiii} On these quirks, see Bloom 2011.
- ^{xxiv} Of course, this is morally problematic, as in the case of gender history disclosure requirements. To be clear, I am not endorsing this obsession with ontological history, just claiming that it will affect demand for sex robots. For a discussion of the moral and legal problems with gender disclosure requirements, see Sharpe 2012.
- ^{xxv} The results of the poll can be found at: <http://big.assets.huffingtonpost.com/toplinesbrobots.pdf>, visited 25/11/2013. There appears to be an error in the report since the figures do not add up to 100%. I corrected for this by lowering the "not sure" figure to 10% from 11%.

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- ^{xxvi} This is one of the motivating factors for Yeoman and Mars's (2012) argument.
- ^{xxvii} See, for example, the report by Manyika et al. 2013 particularly chapter 2 which discusses the prospects for automation.
- ^{xxviii} Frey and Osborne 2013 *The Future of Employment: How Susceptible are Jobs to Computerisation* (Oxford Martin School, Working Report, September 2013), available at http://www.futuretech.ox.ac.uk/sites/futuretech.ox.ac.uk/files/The_Future_of_Employment_OMS_Working_Paper_1.pdf (visited 30/11/13).
- ^{xxix} Levitt and Dubner 2010, chapter 1 look at the earnings of workers at the high end, including one woman who earned around \$300,000 dollars per year. Brooke Magnanti, whose story formed the basis for the TV series *Secret Life of a Call Girl*, reportedly earned £300 per hour as an escort in London (see Gallagher 2009). Similarly, Ashley Dupre, who was implicated in the Eliot Spitzer scandal, was reportedly paid \$3,300 for a single "encounter" (see Westfeld 2008).
- ^{xxx} Levitt and Venkatesh 2007 and also Edlund and Korn 2002, at 182. This holds true even in countries where there has been a massive increase in the supply of prostitution in recent years. For example, in Germany, although prices have gone down since legalisation, prostitutes can still expect to earn more than the minimum wage. See, Tuttle 2013, available at <http://business.time.com/2013/06/18/germany-has-become-the-cut-rate-prostitution-capital-of-the-world/> (visited 30/11/2013).
- ^{xxxi} This book actually a complex model of the economics of prostitution, partly based on risk factors, social exclusion and disgust, as well as career duration.
- ^{xxxii} Why? Because other high risk forms of labour do not attract high wages, particularly for new entrants. A good example of this is wage-earning in drug gangs, which is very low for new entrants. See: Levitt and Venkatesh 2000.
- ^{xxxiii} Note: clients may not demand this. There may be a taboo tax associated with unprotected, human-to-human contact, which human prostitutes can take advantage of in order to secure higher wages. Again, just to be clear, I am not endorsing this practice.
- ^{xxxiv} See, for example, Elizabeth Bernstein's analysis of "the girlfriend experience" in her work (Bernstein 2007).
- ^{xxxv} One could also argue that demand for prostitution will fall on the grounds that the increasingly casual attitude toward sex among the general population will encourage more people to "give it away for free". This may be the case, but if we work with the argument from Yeoman and Mars it looks somewhat doubtful: demand appears to be increasing despite the casual attitude towards sex in many countries (maybe even because of it). Furthermore, this would hit the demand for robot sex just as hard as it would hit the demand for human sex.
- ^{xxxvi} What I have to say here is based largely on the following sources: Raventos 2007; Ackerman, Alstott, and Van Parijs 2006; Van Parijs 1995; and Widerquist et al (eds) 2013.
- ^{xxxvii} See <http://www.basicincome.org/bien/> (visited 30/11/13)
- ^{xxxviii} This is slightly modified from <http://www.basicincome.org/bien/aboutbasicincome.html>
- ^{xxxix} The latter idea being bound up with republican political theory more than liberalism. See Pettit, P. 2012, chapter 1 for a discussion of the republican model of freedom. See Raventos 2007, chapter 3 for a republican defence of the basic income proposal.
- ^{xl} It also faces some practical hurdles, though these are less severe than critics may presume. Raventos 2007, offers a useful overview of and response to the common criticisms. See also the FAQ at <http://www.basicincome.org/bien/aboutbasicincome.html> (visited 30/11/13).
- ^{xli} Though primarily about the UK sex industry, in which prostitution itself is legal though many of the surrounding acts are not, the article reflects on the experience in other jurisdictions, including Australia, which have more completely forms of legalisation. On the latter, see Sullivan 2010; and Murray 2003.