Keeping up with the Influencers: Aspirations, Labour Supply, Sectoral Allocation and Economic Growth

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Research Question

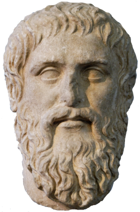
- Research Question: The effect of **visibility platforms** (magazines, television, social media) -> on **consumption and leisure status preferences** -> **macro outcomes**:
- Decades-long downward trend in hours worked
- Increase in leisure time
- Increase in expenditure share of leisure goods
- Decline in productivity growth

Motivation

- **People have status concerns and enjoy recognition from their social position**.
- conspicuous consumption
- experience goods

Plato, 2400 years ago

- Three parts of our soul ⇒ destined vacation ⇒ hidden basis ⇒ innate ideas.
  - a) Reason (thoughts, reflections, questioning)
  - b) Desires (natural, food, vs unnatural e.g. money).
  - c) **Spiritednes (ego, glory, progress, honor - relative position)**



Since... appearance tyrannizes over truth and is lord of happiness, to appearance I must devote myself (Plato, The Republic II, about 2400 years ago)

Work in the micro literature

Existence and Individual Local Contemporay Outcomes

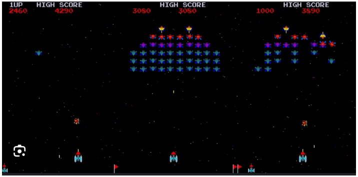
- Banerjee and Duflo (2007, JEP), Case and Paxson (2008JPE), Bursztyn et al. (2018, QJE) people display their social status in low income countries.
- Bursztyn and Jensen (2015, QJE) leaderboards and educational attainment
- Worker effort and performance (Falk and Ichino, 2006; Bandiera, Barankay, and Rasul, 2010)
- Heffetz (2011, ReStat) higher income elasticity of a good that is visible.
- Fruttero, Muller, and Calvo-Gonzalez (2021) Review by the world bank.
- La Ferrara (JEEA, 2019). Determinants of Aspirations (expect top job, expect to finish university)

Work in the macro literature

- **Theories on Aggregate effects**
  - Aspirations Failures and Poverty (Ray, 2006), Genicot and Ray (2020): Socially determined aspirations serve to both inspire and frustrate
  - Aspirations, Growth and Inequality, (Genicot and Ray, 2018, Econometrica)
  - Killer Incentives: Status Competition (Ager, Bursztyn, Leucht, Voth, RES 2020)
  - Savings, Carroll and Weil (1994) Moav O, Neeman Z. 2010
  - Capital accumulation (Brekke & Howarth 2002, Carroll et al. 1997, Liu & Turnovsky 2005, Wendner 2010)
  - Asset pricing (Abel 1999, Dupor & Liu 2003, AER)
  - Inequality (Garcia-Penalosa and Turnovsky, 2015, MD) and Savings Dynamics and Inequality (Dioikitopoulos et al. 2020, IER)

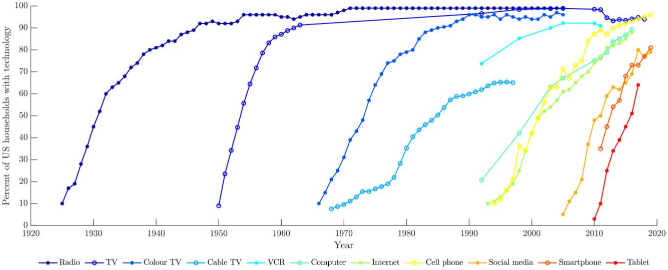
What we add?

1. Theoretical framework that examines the effect of visibility platforms on leisure/work and macroeconomic outcomes.
2. Empirical Evidence (in progress): Individual level data from time use surveys, WVS, Eurobarometer and our own survey.
3. Experimental Evidence (in progress). Video Games and Status Concerns.



Empirical Motivation

- Survey estimates suggest that an estimated 4 billion active users spent over 2 hours daily on various social media platforms, resulting in nearly 3 trillion hours devoted to social media every year. (Globalwebindex, 2020, Rachel, 2024)
- The rise of the attention economy over the past three decades, which has redirected innovation efforts and led to slow traditional productivity growth
- Rachel (2024)



Empirical Motivation

- Aguiar and Hurst (2007) and Gentzkow (2006) find evidence that the **introduction of the television** in the 1950s and 1960s had a **large impact on time allocation** in the United States
- Falck et al. (2014) document the significant impact on leisure time of the roll-out of the internet in Germany in the 2000s
- Aguiar et al. (2021) Using cross-region variation, they estimate that **gaming/recreational computer use** is distinctly a leisure luxury for younger men. Innovations to recreational computing **increased the marginal value of time for younger men**, thereby **reducing their market hours by about 2 percent**

Empirical Motivation: Media and Status Concerns

- **Media and Status Concerns**
- Individual Level Data (22,935, Clark and Senik, 2011)
- Robust evidence that individuals that watch television have higher positional concerns.

Empirical Motivation: Time in Media and Time in Leisure vs Work

- **Time in Media and Time in Leisure vs Work**
- Individual Level Data ATUS
- Evidence that Time in Media has a negative effect in the share of total time on leisure

Instrumental variables 2SLS regression

Number of obs	=	169,014
Wald chi2(6)	=	163.83
Prob > chi2	=	0.0000
R-squared	=	.
Root MSE	=	446.55

totalleisu~e	Coefficient	Std. err.	z	P>|z|	[95% conf.	interval]
act_media	3.284209	.9132251	3.60	0.000	1.494321	5.074098
age	-3.878239	1.166395	-3.32	0.001	-6.164331	-1.592147
sex	119.3188	31.69042	3.77	0.000	57.20671	181.4309
citizen	7.407243	1.849425	4.01	0.000	3.782436	11.03205
income	-3.737857	.4843634	-7.72	0.000	-4.687192	-2.788522
diary	8.569847	2.792661	3.07	0.002	3.096331	14.04336
_cons	-453.6308	143.6104	-3.16	0.002	-735.1019	-172.1596

Empirical Motivation: Use of Media and Leisure Preferences

- **Use of TV and Internet and Leisure Preferences**
- Individual Level WVS
- Depended: Leisure time / time to relax and do what you enjoy. (Important vs Less Important)
- Independed: How often do you do the following in your free time? (TV and Internet)
- Instrument: Preference for technology

- **Use of TV and Internet and Leisure Preferences**
- Controlling for demographic and year and countries fixed effects

Instrumental variables (2SLS) regression

Number of obs	=	84,683
Wald chi2(65)	=	8754.02
Prob > chi2	=	0.0000
R-squared	=	.
Root MSE	=	.96699

leisure	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
tv	.6836611	.132869	5.15	0.000	.4232426	.9440796
sex	-.0557708	.0108631	-5.13	0.000	-.077062	-.0344796
birth	.003733	.0003364	11.10	0.000	.0030736	.0043923

Empirical Motivation: Social Networks Use and Work Hours

- **Social Networks Uses and Work Hours**
- Country Level Data - Eurostat
- Depended: Work Hours
- Independed: Internet use: participating in social networks
- Instrument: Broadband internet coverage and Level of Internet Access

Empirical Motivation: Social Networks Use and Work Hours

- **Social Networks Uses and Work Hours**
- Controlling for economic variable and year and countries fixed effects

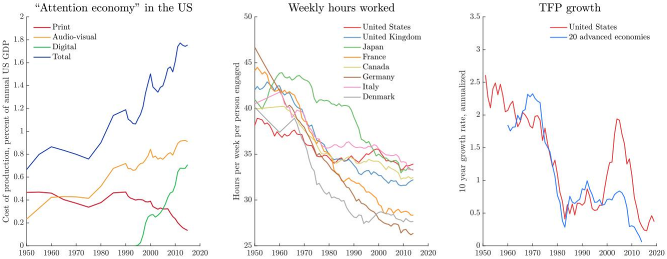
Instrumental variables (2SLS) regression

Number of obs	=	204
Wald chi2(11)	=	162.71
Prob > chi2	=	0.0000
R-squared	=	0.0772
Root MSE	=	4.9298

weekly_hours_work_15_24	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
percentage_social_networks	-.5525212	.1087255	-5.08	0.000	-.7656193	-.3394231

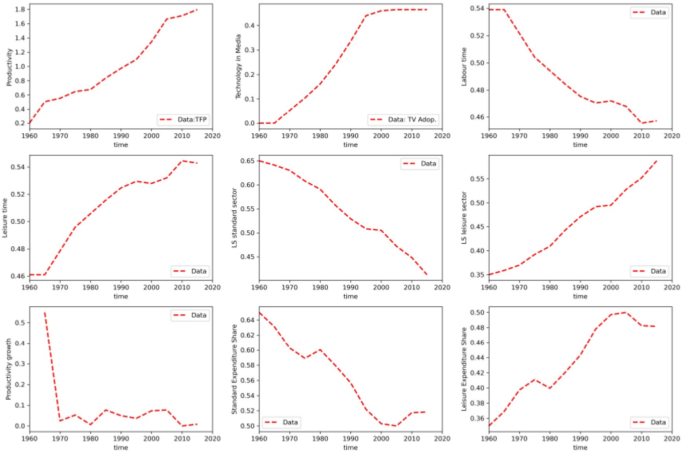
Empirical Motivation: Macro Data

- **Macro Data**



Empirical Motivation: US Data

- **US Macro Data**



Empirical Motivation: US Data

- US Macro Data
- Employment in Leisure Sector and Hospitality
- Employment in Other Sectors
- Consumption share for recreation activities
- Consumption share in other activities
- Adoption of Media
- TFP and TFP growth
- Share of Hours on Leisure and Work

Macro Dynamics and Leisure Literature

- Boppart and Krusell (2020) highlight the class of preferences in which **income effects dominate substitution effects** in determining agents optimal time allocation in a growing economy
- Ngai and Pissarides (2008) focus on the role of **sectoral differences in productivity growth**
- A similar idea is advanced by Boppart and Ngai (2021) whose study also accounts for the fact that the rate of increase in **leisure time is inversely related to educational attainment**

Macro Dynamics and Leisure Literature

- Rachel (2025) emphasises the role of attention-grabbing investments that increase the desirability of leisure services, thus shifting **R&D expenditures towards leisure-supporting activities**
- Cruz and Raurich (2020) **positive income elasticity of leisure activities** under subsistence consumption

Preferences

- Preferences

$$u_t = \eta ln(c_{S,t} - \upsilon_t \bar{C}_{S,t}) + \theta ln(\psi_{l,t} - \upsilon_t \bar{\Psi}_{l,t}) + (1 - \eta - \theta) ln(k_{t+1})$$

- $c_{S,t}$, consumption of a standard good, $\bar{C}_{S,t}$ reference level (average consumption).
- $\psi_{l,t}$, consumption of a leisure good where $\bar{\Psi}_{l,t}$ leisure good reference, and

$$\psi_{l,t} = l_t c_{l,t}$$

- Altruistic parents bequeath capital to their offspring, k_{t+1}.

Visibility platform

- Visibility platform (status "signalling" device)

$$v_t = v(h_t)$$

such that $v(h_t) \in [0,1]$, $v(h_t) = 0$ for $h_t \leq \underline{h}$ ($\underline{h} > 0$), $v'(h_t) > 0$ for $h_t \geq \underline{h}$ and $\lim_{h_t \to \infty} v(h_t) = \overline{v} \leq 1$

- where h_t is the economy-wide productivity. Example:

$$v(h_t) \equiv \begin{cases} 0 & \text{if} \quad h_t \leq \underline{h} \\ \overline{v}\left(1 - e^{-\lambda(h_t^{\beta} - \underline{h}^{\beta})}\right) & \text{if} \quad h_t > \underline{h} \end{cases},$$

Time and Budget Constraint

- Time constraint: Once reaches adulthood, each agent has on unit of time allocated to leisure time and labour

$$1 = l_t + n_t$$

- Budget constraint

$$c_{S,t} + pc_{I,t} + i_t = R_t k_t + w_t n_t$$

Production technology

- Production for each sector

$$y_{j,t} = A_j k_{j,t}^{\alpha} (h_t n_{j,t})^{1-\alpha}$$

- Economy-wide learning spillovers, the economy's productivity is related to the average stock of capital, $h_t = \bar{k}_t$ (in equilibrium (homogeneity) $\bar{k}_t = k_t$)
- Capital accumulation $k_{t+1} = i_t$

Results: Visibility and Choices

- **Expenditures and Investment Shares**
- Stronger lifestyle aspirations, induced by a higher υ_t , increase the share of income spent on consumption and leisure activities, and reduce the share of income devoted to capital investment. Formally,

Lemma 1. $\frac{\partial(c_{S,t} / (R_t k_t + w_t n_t))}{\partial v_t} > 0$, $\frac{\partial(p c_{L,t} / (R_t k_t + w_t n_t))}{\partial v_t} > 0$, $\frac{\partial(i_t / (R_t k_t + w_t n_t))}{\partial v_t} < 0$.

Results: Visibility and Choices

- **Time allocation**
- Stronger lifestyle aspirations, induced by a higher υ_t, induce agents to spend more time in leisure activities at the expense of their labour supply. That is

$$\textbf{Lemma 2.}\ \frac{\partial l_t}{\partial v_t} > 0\,,\ \frac{\partial n_t}{\partial v_t} < 0\,.$$

Results: Visibility and Choices

- **Sectoral labour and expenditure allocation**
- Stronger lifestyle aspirations, induced by a higher υ_t, reallocate input and expenditure shares towards the leisure goods sector at the expense of the standard goods sector.

Lemma 3. $\frac{\partial f_{S,t}}{\partial \upsilon_t} < 0$, $\frac{\partial f_{L,t}}{\partial \upsilon_t} > 0$.

Results - Dynamics

- Time Allocation Dynamics

$$n_t = \begin{cases} \dfrac{(1-a)[1-(1-\eta-\theta)\underline{v}]}{\theta+(1-a)[1-(1-\eta-\theta)\underline{v}]} & \text{if} \quad h_t \le \underline{h} \\ \dfrac{(1-a)\{\bar{h}-\underline{h}-(1-\eta-\theta)[\underline{v}(\bar{h}-\underline{h})+(\bar{v}-\underline{v})(h_t-\underline{h})]\}}{\theta(\bar{h}-\underline{h})+(1-a)\{\bar{h}-\underline{h}-(1-\eta-\theta)[\underline{v}(\bar{h}-\underline{h})+(\bar{v}-\underline{v})(h_t-\underline{h})]\}} & \text{if} \quad h_t \in (\underline{h},\bar{h}) \\ \dfrac{(1-a)[1-(1-\eta-\theta)\bar{v}]}{\theta+(1-a)[1-(1-\eta-\theta)\bar{v}]} & \text{if} \quad h_t \ge \bar{h} \end{cases},$$

and

$$l_t = \begin{cases} \dfrac{\theta}{\theta+(1-a)[1-(1-\eta-\theta)\underline{v}]} & \text{if} \quad h_t \le \underline{h} \\ \dfrac{\theta(\bar{h}-\underline{h})}{\theta(\bar{h}-\underline{h})+(1-a)\{\bar{h}-\underline{h}-(1-\eta-\theta)[\underline{v}(\bar{h}-\underline{h})+(\bar{v}-\underline{v})(h_t-\underline{h})]\}} & \text{if} \quad h_t \in (\underline{h},\bar{h}) \\ \dfrac{\theta}{\theta+(1-a)[1-(1-\eta-\theta)\bar{v}]} & \text{if} \quad h_t \ge \bar{h} \end{cases}.$$

Results - Dynamics

- Sectoral Allocation Dynamics

$$f_{S,t} = \begin{cases} \dfrac{1-\theta-(1-\eta-\theta)\underline{v}}{1-(1-\eta-\theta)\underline{v}} & \text{if} \quad h_t \le \underline{h} \\ \dfrac{(1-\theta)(\overline{h}-\underline{h})-(1-\eta-\theta)[\underline{v}(\overline{h}-\underline{h})+(\overline{v}-\underline{v})(h_t-\underline{h})]}{\overline{h}-\underline{h}-(1-\eta-\theta)[\underline{v}(\overline{h}-\underline{h})+(\overline{v}-\underline{v})(h_t-\underline{h})]} & \text{if} \quad h_t \in (\underline{h},\overline{h}) \\ \dfrac{1-\theta-(1-\eta-\theta)\overline{v}}{1-(1-\eta-\theta)\overline{v}} & \text{if} \quad h_t \ge \overline{h} \end{cases},$$

and

$$f_{L,t} = \begin{cases} \dfrac{\theta}{1-(1-\eta-\theta)\underline{v}} & \text{if} \quad h_t \le \underline{h} \\ \dfrac{\theta(\overline{h}-\underline{h})}{\overline{h}-\underline{h}-(1-\eta-\theta)[\underline{v}(\overline{h}-\underline{h})+(\overline{v}-\underline{v})(h_t-\underline{h})]} & \text{if} \quad h_t \in (\underline{h},\overline{h}) \\ \dfrac{\theta}{1-(1-\eta-\theta)\overline{v}} & \text{if} \quad h_t \ge \overline{h} \end{cases}.$$

Lifestyle Status Perceptions and Economic Dynamics

Proposition (1)

Once the economy reaches the stage of economic development in which the visibility platform becomes operative, the ***intensification of lifestyle status perceptions*** *contributes to a gradual* ***decline of the supply of labour*** *and a corresponding* ***increase of the time devoted to leisure activities****. Furthermore,* ***the employment and expenditure shares of the leisure goods' sector increase****, whereas the employment and* ***expenditure shares of the standard goods' sector decline****.*

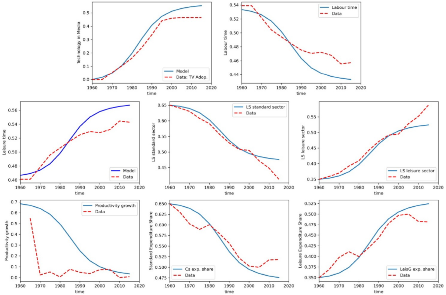
Lifestyle Status Perceptions and Economic Dynamics

Proposition (2)

Once the economy reaches the stage of economic development in which the visibility platform becomes operative, the intensification of ***lifestyle status perceptions hinder the economy's growth performance****.*

Numerical Example: US Data

Using standard parameters from the literature Raurich and Cruz (2020)



Coming Next

- Our own survey: Time Allocation and Influencers Preferences
- We are currently conducting an economic experiment using a video game with three treatments a) Play a video game alone knowing your score b) a + your score relative to the others c) b + others know your score and you know that.

Coming Next

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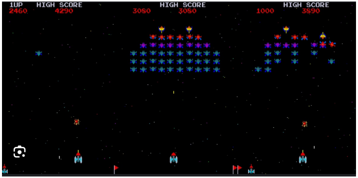

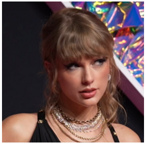

- Thank You!!!