Technology Fairs as Industrial Policy: Innovation and Export Promotion at the 1900 Paris World Exhibition

Gabor Bekes[1], Matyas Molnar[2], and Claudia Steinwender[3]

[1]CEU, CEPR, KRTK
[2]CEU
[3]LMU, CEPR, CEP, CESifo

April 30, 2025

Motivation

- **What prevents firms from exporting?**
  - Tariffs?
  - But: Even when tariffs were low (pre–trade war), export participation was below what trade theory predicts ("dark trade costs," Head and Mayer 2013)

Motivation

- **What prevents firms from exporting?**
  - Tariffs?
  - But: Even when tariffs were low (pre–trade war), export participation was below what trade theory predicts ("dark trade costs," Head and Mayer 2013)
- **Matching frictions between buyers and sellers?**
  - Many export promotion policies aim to reduce search and matching frictions
  - But: Hard to isolate policy effects from firms' unobserved search efforts

Motivation

- **What prevents firms from exporting?**
  - Tariffs?
  - But: Even when tariffs were low (pre–trade war), export participation was below what trade theory predicts ("dark trade costs," Head and Mayer 2013)
- **Matching frictions between buyers and sellers?**
  - Many export promotion policies aim to reduce search and matching frictions
  - But: Hard to isolate policy effects from firms' unobserved search efforts
- **This paper: 1900 Paris World Exhibition as natural export promotion policy experiment**
  - Limited private initiative—communication was costly and slow
  - Product-specific space constraints in Paris plus political desire to represent all Hungarian industries and regions—allows us to address selection bias
  - New Hungarian firm-level panel data matched across historical directories

Paper in a nutshell

- **Research question: Does technology fair lead to more exporting?**
  - Selection bias: firms that participate often intend to export anyways, are more successful
- **Identification strategy**
  - Use trial-exhibition to get a proxy for unobserved firm export potential: award categories
  - Use space constraints in Paris plus political desire to represent all Hungarian industries and regions
  - Even within award categories, probably positive selection
  - Idea: compare untreated firms in better award category to treated firms in lower award category $\Rightarrow$ should downward bias results
- **Preliminary findings**
  - Balancing confirms positive selection
  - Attending technology fair increases export propensity

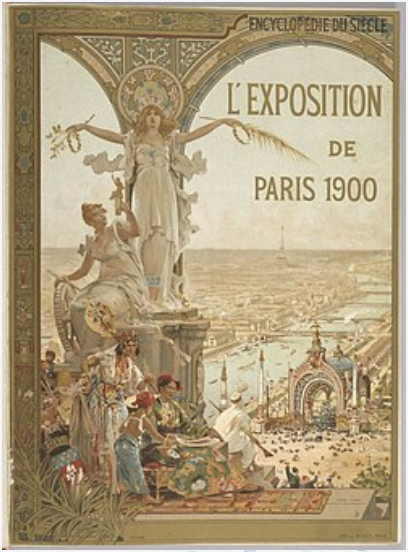
Why use historical example to answer current policy question?

- **Industrial policies (such as export promotion) widely debated again, but causal evidence hard/limited**
  - Often many policies happen at once, hard to isolate effects
  - Historical setup helps: large event, no comparable policy
- **Our setup offers unique identification strategy for causal analysis**
  - Made possible by the nature of the policy – using Budapest 1896 expo as trial

The Paris exhibition as policy tool for Hungary

Paris exhibition as export promoting industrial Policy

- Paris exhibition – largest to celebrate modernity
  - 48 million visitors,
  - 70 thousand businesses,
  - 56 countries
- Innovations: palace of electricity, moving sidewalk, metro, diesel engine
- Business showcase their products + meetings, networking



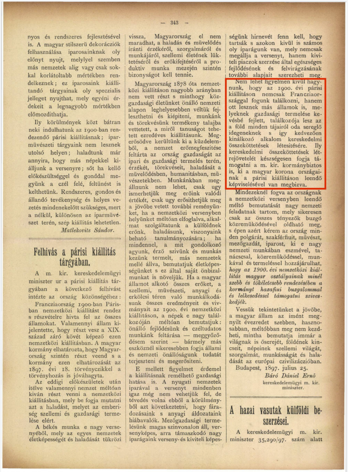
Hungarian Kingdom treated Paris as policy tool for modernization

- First major exhibition when Hungary alone
- Hungary 3000 exhibitors, 3rd largest outside of France
- Hungary prepared since 1887(!), established institutions, committees
- Budapest Millennial Exhibition in 1896 as a "rehearsal exhibition"

Forming export connections as an explicit target … from 1887

"… the 1900 Paris Exhibition… **will be a meeting place for foreigners flocking there from all parts of the world, and thus a favorable opportunity for establishing commercial connections.** The Hungarian Royal Commissioner, who …is… organizing the representation of the countries of the Hungarian Crown … will support the establishment of such commercial connections."

Hungarian Industrial Journal 1897 ed. 2, by Baron Ernő Dániel, Hungarian Royal Minister of Commerce



Large effort from Hungarian government to promote firms in Paris

- Goal: Increase export market access by reducing information frictions
  - Lack of communication technologies prevented firms to learn about foreign markets (demand and preferences)
  - Globalization enabled faster shipping between remote locations
- Policy: selecting firms to present in Paris and covering costs of exhibiting
- Selection by serious jury that considered firm and products not exhibited as well.
- Selection based on innovativeness and diversity of the Hungarian exhibition

Related literature

- Trade/export promotion (Munch and Schaur, 2018; Volpe Martincus and Carballo, 2010; Harding and Javorcik, 2012)
  - Mitigating search and matching costs (Kneller and Pisu, 2011; Miyauchi, forthcoming)
  - Trade shows (Sarmento and Simoes, 2018)
- Industrial policy and its effects on the economy (Juhasz, 2018; Mitrunen, 2024)
  - Accessing foreign markets (Helleiner, 2021)
  - Intellectual property rights protection (Moser, 2005 and 2012)
  - Industrial development, firm productivity (Levchenko and Choi, 2025)
- Industrial development and great divergence in the 19th century (Pascali, 2017) and more recently in India (Topalova and Khandelwal, 2011)

Explaining how we used the 1896 Budapest awards for identification

Address selection bias in several steps

- Selection bias: most innovative/productive firms have likely been selected, unobserved growth potential
- Address selection bias in several steps:
  1. Narrow down sample to firms that attended the 1896 Budapest national exhibition
  2. Use the awards from the Budapest exhibition to control for firm quality
  3. Measure outcomes using naive regression with controls, but with unbalanced sample
  4. Balance sample by downward biasing treatment effect by comparing better non-attendees to worse attendee firms $\rightarrow$ details are following now

Suppose better firms receive better awards

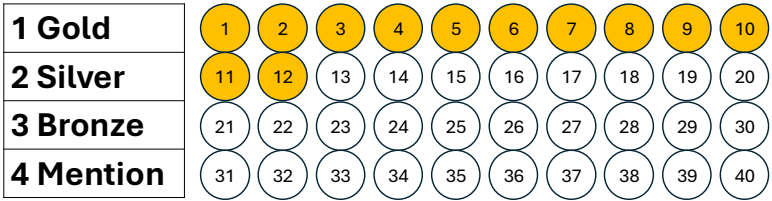
Numbers = firms ranked by productivity

Gold	1	2	3	4	5	6	7	8	9	10
Silver	11	12	13	14	15	16	17	18	19	20
Bronze	21	22	23	24	25	26	27	28	29	30
No Medal	31	32	33	34	35	36	37	38	39	40

Assume, Hungary has 12 slots in Paris
If they sent the best firms, they would send ...

If there is no balancing, the best firms go to Paris

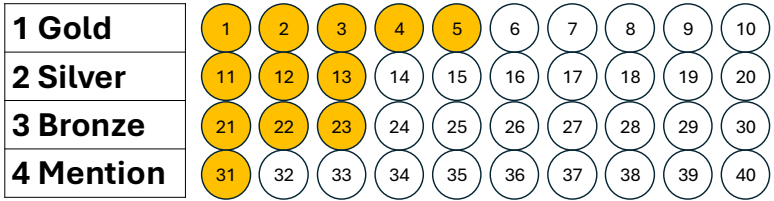
Numbers = firms ranked by productivity



... the yellow firms
Clearly comparing the yellow firms to the white firms would give biased treatment effects
Even within award category

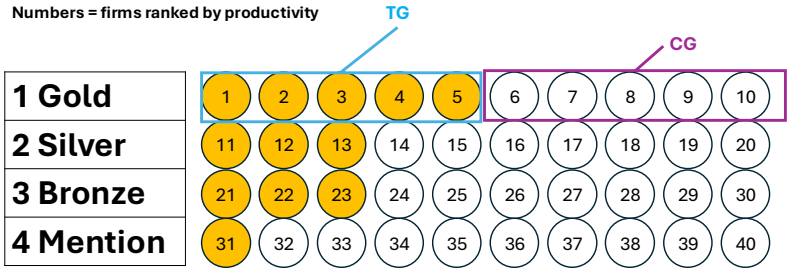
Government attempts to balance industries, thus firms from worse categories also make it to Paris

Numbers = firms ranked by productivity



But because they wanted to keep industry and regional representation, they could not send the top 12 firms.
They started with the best, but once the region or industry-cutoff was hit, they went to the next category, etc.
We do not observe the ordering within award classes, otherwise we could do a RDD
BUT, we can bias us against finding a result ...

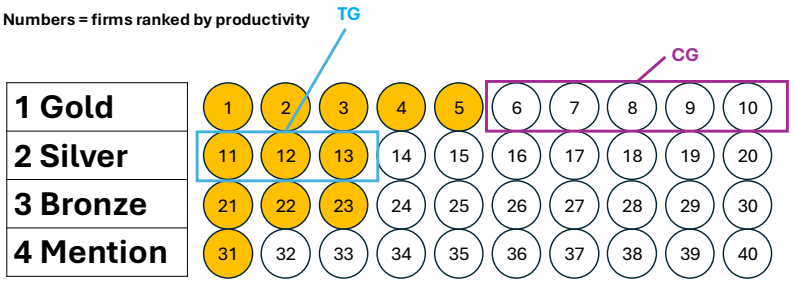
Even if we compare firms within the same categories, there will be bias



By comparing untreated obs in the top category with treated observations one category below, etc....

Problem: Overestimate impact becase (1,2,3,4,5) >> (6,7,8,9,10)

If we compare treated firms from worse classes, estimate will also be biased but downwards



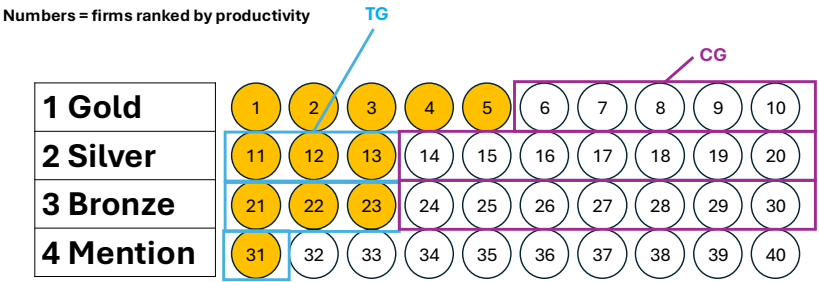
By comparing untreated obs in the top category with treated observations one category below, etc....

This will certainly underestimate because (6,7,8,9,10) >> (11,12,13)

Attempt to estimate a band for casual effect

- Underlying quality confounds Paris exhibition as well as export status (increases probabilities for both)
- Casual effect is likely between the biased estimates (comparing firms within the same category) and the downward-biased estimates (comparing treated firms from worse category to control firms from better category)

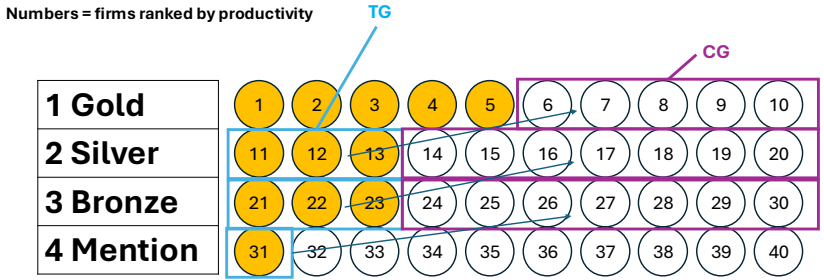
We can do across categories where awards were given



By comparing untreated obs in the top category with treated observations one category below, etc....
Same with silver-bronze, etc.

We can do across categories where awards were given

From now on, we refer to a these comparison classes (e.g. untreated firms in Gold and treated firm in Silver) as "downward-biased Budapest classes"



By comparing untreated obs in the top category with treated observations one category below, etc....
Same with silver-bronze, etc.

Sample selection is an important part of identification

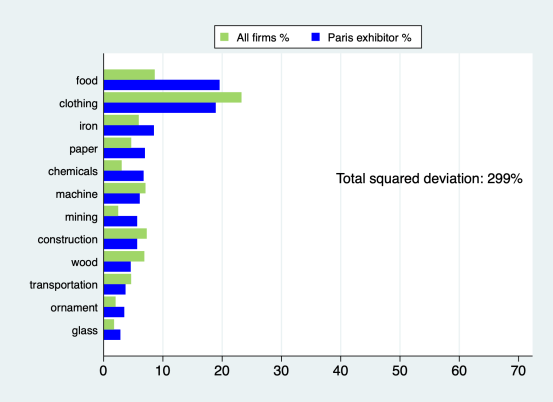
- **Credible comparison made for a limited sample**
  - we lose about 50% of sample.
  - May be small downward bias of estimates
- **Firms are dropped that**
  - are Paris exhibition attendees from the best Budapest award class
  - are not Paris attendees from the last award class
  - did not receive an award: there are various reasons for not receiving an award, thus quality comparison is not possibly

Better awarded firms were more likely to attend the Paris expo
But there is variation across categories

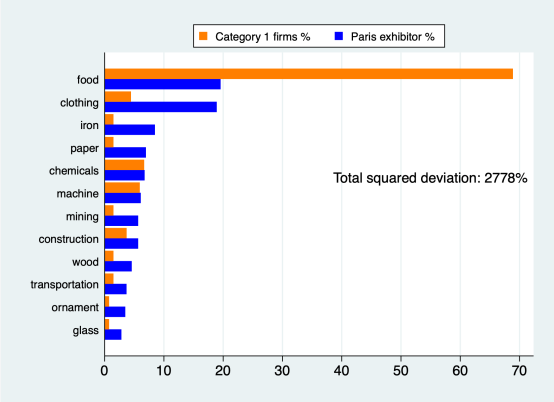
Awards	**Number of firms**	**Paris exhibitor**
Budapest 1. Gold	135	56%
Budapest 2. Silver	398	31%
Budapest 3. Bronze	1005	13%
Budapest 4. Mention	1063	6%
No award	1114	8%
Total	3715	100%

Budapest awards predict Paris attendance, but selection committees balanced Paris attendees across industries as well

Representativeness of industries: % firms in Paris close to % Budapest exhibitors



Even though based on awards, food should have been more represented, clothing less



Data collection and description

Data: Creating a historical "panel data" set for Hungary 1894-1909

- Company is a private enterprise...
  - mostly incorporated, but may be partnership
  - Not state-owned or municipal or NGO
  - it is a business, not an artisan
- Timeline
  - Sample: is a company, exist in 1896 and exhibits in Budapest **1896**
  - Treatment: is exhibitor in **1900**
  - Outcome: is exporter in **1904**
- Create Company * 3 periods (1896, 1900, 1904) panel
  - There are plenty of issues of linking firms.

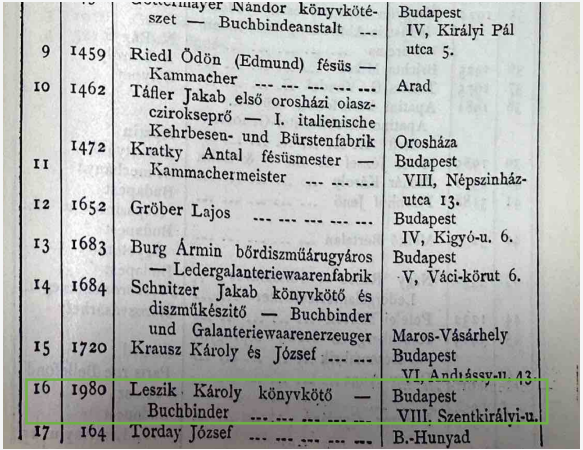
Data: Data comes from many different sources

1. Paris *Exposition Universelle* catalog **1900** – list of exhibitors
2. Firm survey by the Hungarian Museum of Commerce (1894, 1898, 1904) – firm-level outcomes such as export
3. Budapest Millenial Exhibition catalog **1896** – list of exhibitors and their characteristics
4. Budapest Exhibition Brochure **1896** – awards

Data: Paris catalog – technical steps to extract data

Digitization steps

- Source: *Guide to the 1900 Hungarian Exhibition in Paris: Introduction to Hungary*
- After scanning relevant pages, extract text using Google Document AI OCR
- Use Chat GPT AI to separate exhibitors from each other
- Human checks to correct mistakes and match addresses to exhibitors

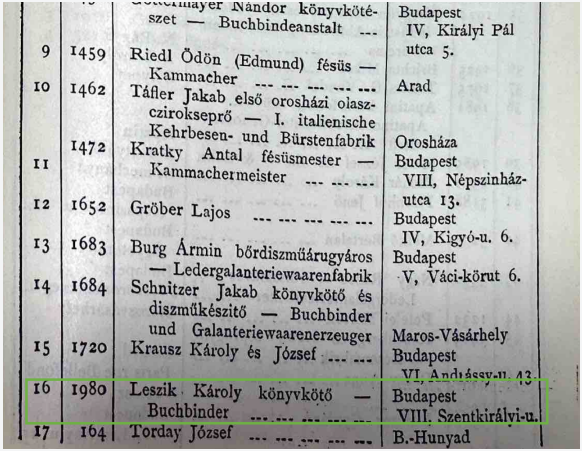


		Gottermayer Nándor könyvkötészet — Buchbindeanstalt ---	Budapest IV, Királyi Pál utca 5.
9	1459	Riedl Ödön (Edmund) fésüs — Kammacher --- --- --- --- ---	
10	1462	Täfler Jakab első orosházi olaszcziroksepről — I. italienische Kehrbesen- und Bürstenfabrik	Arad
11	1472	Kratky Antal fésüsmester — Kammachermeister --- --- ---	Orosháza Budapest VIII, Népszinház-utca 13.
12	1652	Gröber Lajos --- --- --- --- ---	Budapest IV, Kigyó-u. 6.
13	1683	Burg Ármin bőrdiszműárugyáros — Ledergalanteriewaarenfabrik	Budapest V, Váci-körut 6.
14	1684	Schnitzer Jakab könyvkötő és diszműkészitő — Buchbinder und Galanteriewaarenerzeuger	Maros-Vásárhely
15	1720	Krausz Károly és József --- ---	Budapest VI, Andrássy-u. 43.
16	1980	Leszik Károly könyvkötő — Buchbinder --- --- --- --- ---	Budapest VIII. Szentkirályi-u.
17	164	Torday József --- --- --- --- ---	B.-Hunyad

Data: Paris catalog – treated firms are exhibitors

How to determine whether an exhibitor is a firm

- We identify 803 companies as exhibitors
- Full: 2589 exhibitors, but drop
  - 820 non-profit exhibitor (e.g. museums)
  - 65 government-owned firms
  - 901 individual artist/professional/entrepreneur (can't match to company)

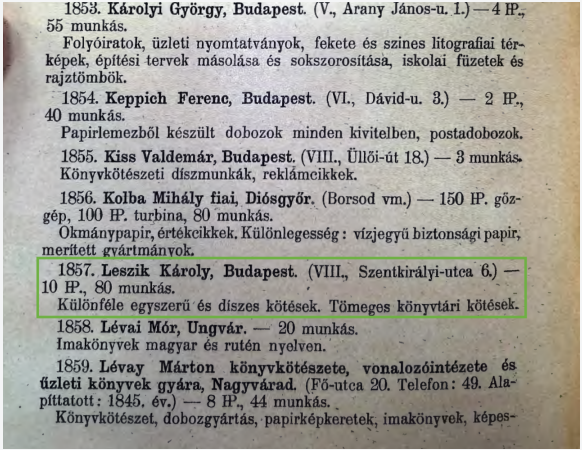


		Gottelmayer Nándor könyvkötészet — Buchbindeanstalt ---	Budapest IV, Királyi Pál utca 5.
9	1459	Riedl Ödön (Edmund) fésüs — Kammacher --- --- --- --- ---	Arad
10	1462	Táfler Jakab első oroszházi olaszczirokseprő — I. italienische Kehrbesen- und Bürstenfabrik	Orosháza
11	1472	Kratky Antal fésüsmester — Kammachermeister --- --- ---	Budapest VIII, Népszinház-utca 13.
12	1652	Gröber Lajos --- --- --- --- ---	Budapest IV, Kigyó-u. 6.
13	1683	Burg Ármin bőrdiszműárugyáros — Ledergalanteriewaarenfabrik	Budapest V, Váci-körut 6.
14	1684	Schnitzer Jakab könyvkötő és diszműkészitő — Buchbinder und Galanteriewaarenerzeuger	Maros-Vásárhely
15	1720	Krausz Károly és József --- ---	Budapest VI, Andrássy-u. 43.
16	1980	Leszik Károly könyvkötő — Buchbinder --- --- --- --- ---	Budapest VIII. Szentkirályi-u.
17	164	Torday József --- --- --- --- ---	B.-Hunyad

Data: Firm registry 1904 – technical steps to extract data

Digitization steps

- Source: *Export address book* by the Hungarian Museum of Commerce
- Based on a survey of factories and plants
- Scan + Google Document AI OCR
- numbered entries—observations easily separated
- extract columns, for example numbers before HP (horsepower) or munkas (worker)



1853. **Károlyi György, Budapest.** (V., Arany János-u. 1.) — 4 HP., 55 munkás.
Folyóiratok, üzleti nyomtatványok, fekete és szines litografiai térképek, építési tervek másolása és sokszorosítása, iskolai füzetek és rajztömbök.

1854. **Keppich Ferenc, Budapest.** (VI., Dávid-u. 3.) — 2 HP., 40 munkás.
Papirlemezből készült dobozok minden kivitelben, postadobozok.

1855. **Kiss Valdemár, Budapest.** (VIII., Üllői-út 18.) — 3 munkás.
Könyvkötészeti díszmunkák, reklámeikkek.

1856. **Kolba Mihály fiai, Diósgyőr.** (Borsod vm.) — 150 HP. gőzgép, 100 HP. turbina, 80 munkás.
Okmánypapir, értékcikkek. Különlegesség: vízjegyű biztonsági papir, merített gyártmányok.

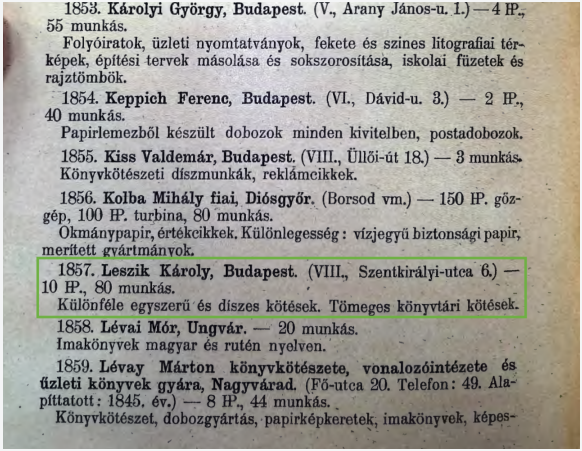
1857. **Leszik Károly, Budapest.** (VIII., Szentkirályi-utca 6.) — 10 HP., 80 munkás.
Különféle egyszerű és díszes kötések. Tömeges könyvtári kötések.

1858. **Lévai Mór, Ungvár.** — 20 munkás.
Imakönyvek magyar és rutén nyelven.

1859. **Lévay Márton könyvkötészete, vonalozóintézete és üzleti könyvek gyára, Nagyvárad.** (Fő-utca 20. Telefon: 49. Alapíttatott: 1845. év.) — 8 HP., 44 munkás.
Könyvkötészet, dobozgyártás, papirképkeretek, imakönyvek, képes-

Data: Firm registry 1904 – outcomes

- Collection of export status (export-ready) firms determined by a Hungarian institution
- Outcomes observed
  - Number of workers
  - Capacity of machine in horsepower (hp)
  - Products offered
  - Factory locations
  - Phone number, telegraph address
  - Special products and patents
  - Industry



1853. **Károlyi György, Budapest.** (V., Arany János-u. 1.) — 4 HP., 55 munkás.
Folyóiratok, üzleti nyomtatványok, fekete és szines litografiai térképek, építési tervek másolása és sokszorosítása, iskolai füzetek és rajztömbök.

1854. **Keppich Ferenc, Budapest.** (VI., Dávid-u. 3.) — 2 HP., 40 munkás.
Papirlemezből készült dobozok minden kivitelben, postadobozok.

1855. **Kiss Valdemár, Budapest.** (VIII., Üllői-út 18.) — 3 munkás.
Könyvkötészeti díszmunkák, reklámcikkek.

1856. **Kolba Mihály fiai, Diósgyőr.** (Borsod vm.) — 150 HP. gőzgép, 100 HP. turbina, 80 munkás.
Okmánypapir, értékcikkek. Különlegesség: vízjegyű biztonsági papir, merített gyártmányok.

1857. **Leszik Károly, Budapest.** (VIII., Szentkirályi-utca 6.) — 10 HP., 80 munkás.
Különféle egyszerű és díszes kötések. Tömeges könyvtári kötések.

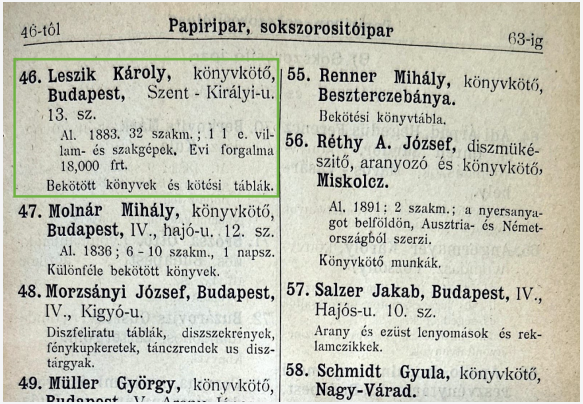
1858. **Lévai Mór, Ungvár.** — 20 munkás.
Imakönyvek magyar és rutén nyelven.

1859. **Lévay Márton könyvkötészete, vonalozóintézete és üzleti könyvek gyára, Nagyvárad.** (Fő-utca 20. Telefon: 49. Alapíttatott: 1845. év.) — 8 HP., 44 munkás.
Könyvkötészet, dobozgyártás, papirképkeretek, imakönyvek, képes-

Data: Budapest catalog 1896 and awards – technical steps to extract data

Digitization steps

- Source: *General catalog of the 1896 Millennium National Exhibition* ed. Mudrony Soma, Ráth Károly, Micseh Endre.
- Scan, OCR, and regex used as for previous data sources
- Challenge: unstructured data, manual separation of fields were required for most observations
- Awards are processed similarly, matched to exhibitors by their names—fuzzy matching



46-tól **Papiripar, sokszorositóipar** 63-ig

46. Leszik Károly, könyvkötő, **Budapest,** Szent - Királyi-u. 13. sz.
Al. 1883. 32 szakm.; 1 1 e. villam- és szakgépek. Evi forgalma 18,000 frt.
Bekötött könyvek és kötési táblák.

47. Molnár Mihály, könyvkötő, **Budapest,** IV., hajó-u. 12. sz.
Al. 1836; 6 - 10 szakm., 1 napsz.
Különféle bekötött könyvek.

48. Morzsányi József, Budapest, IV., Kigyó-u.
Diszfeliratu táblák, diszszekrények, fénykupkeretek, táncrendek us diszlárgyak.

49. Müller György, könyvkötő,

55. Renner Mihály, könyvkötő, **Beszterczebánya.**
Bekötési könyvtábla.

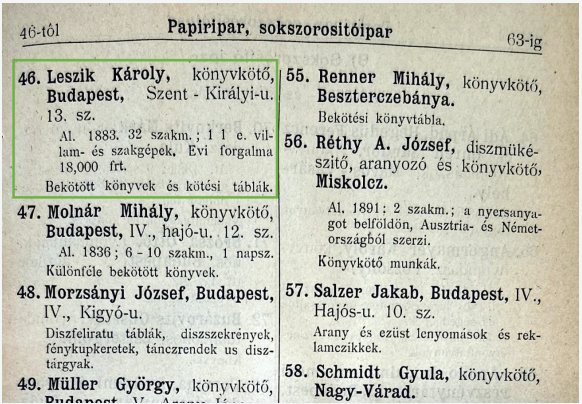
56. Réthy A. József, diszmükészitő, aranyozó és könyvkötő, **Miskolcz.**
Al. 1891: 2 szakm.; a nyersanyagot belföldön, Ausztria- és Németországból szerzi.
Könyvkötő munkák.

57. Salzer Jakab, Budapest, IV., Hajós-u. 10. sz.
Arany és ezüst lenyomások és reklamczikkek.

58. Schmidt Gyula, könyvkötő, **Nagy-Várad.**

Data: Budapest catalog – pretreatment characteristics and sample

- List of attendees of the Budapest expo in 1896
- Outcomes observed
  - Number of workers (including skilled/unskilled)
  - Capacity of machine in horsepower (hp)
  - Products offered and exhibited
  - Address and other locations including offices, warehouses, agencies, and factories
  - Special products and patents
  - Output measured in Hungarian forints
  - Export destinations
  - Year of firm establishment
  - Exhibition category (industry)



46-tól **Papiripar, sokszorositóipar** 63-ig

46. Leszik Károly, könyvkötő, **Budapest,** Szent - Királyi-u. 13. sz.
Al. 1883. 32 szakm.; 1 l. e. villam- és szakgépek. Evi forgalma 18,000 frt.
Bekötött könyvek és kötési táblák.

47. Molnár Mihály, könyvkötő, **Budapest,** IV., hajó-u. 12. sz.
Al. 1836; 6 - 10 szakm., 1 napsz.
Különféle bekötött könyvek.

48. Morzsányi József, Budapest, IV., Kigyó-u.
Diszfeliratu táblák, diszszekrények, fénykupkeretek, táncrendek us diszlárgyak.

49. Müller György, könyvkötő, **Budapest.**

55. Renner Mihály, könyvkötő, **Beszterczebánya.**
Bekötési könyvtábla.

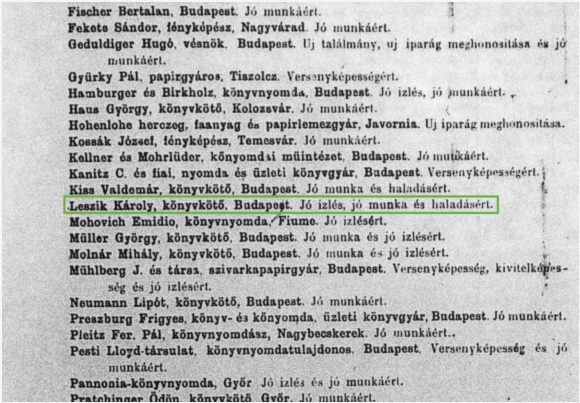
56. Réthy A. József, diszmükészitő, aranyozó és könyvkötő, **Miskolcz.**
Al. 1891: 2 szakm.; a nyersanyagot belföldön, Ausztria- és Németországból szerzi.
Könyvkötő munkák.

57. Salzer Jakab, Budapest, IV., Hajós-u. 10. sz.
Arany és ezüst lenyomások és reklamczikkek.

58. Schmidt Gyula, könyvkötő, **Nagy-Várad.**

Data: Use awards from 1896 Budapest exhibition to proxy firm quality

- Awards from 1896 Budapest expo – given by jury
- Outcomes observed
  - Name of awardee
  - Address
  - Exhibition category
  - Award category (class 1-4, 1 is "Gold")
  - Explanation for the award



Fischer Bertalan, Budapest. Jó munkáért.
Fekete Sándor, fényképész, Nagyvárad. Jó munkáért.
Geduldiger Hugó, vésnök. Budapest. Uj találmány, uj iparág meghonosítása és jó munkáért.
Gyürky Pál, papirgyáros, Tiszolcz. Versenyképességért.
Hamburger és Birkholz, könyvnyomda, Budapest. Jó izlés, jó munkáért.
Haus György, könyvkötő, Kolozsvár. Jó munkáért.
Hohenlohe herczeg, faanyag és papirlemezgyár, Javornia. Uj iparág meghonosítása.
Kossák József, fényképész, Temesvár. Jó munkáért.
Kellner és Mohrlüder, könyomdai müintézet, Budapest. Jó munkáért.
Kanitz C. és fiai, nyomda és üzleti könyvgyár, Budapest. Versenyképességért.
Kiss Valdemár, könyvkötő, Budapest. Jó munka és haladásért.
Leszik Károly, könyvkötő, Budapest. Jó izlés, jó munka és haladásért.
Mohovich Emidio, könyvnyomda, Fiume. Jó izlésért.
Müller György, könyvkötő, Budapest. Jó munka és jó izlésért.
Molnár Mihály, könyvkötő, Budapest. Jó munka és jó izlésért.
Mühlberg J. és társa, szivarkapapirgyár, Budapest. Versenyképesség, kivitelképesség és jó izlésért.
Neumann Lipót, könyvkötő, Budapest. Jó munkáért.
Preszburg Frigyes, könyv- és könyomda, üzleti könyvgyár, Budapest. Jó munkáért.
Pleitz Fer. Pál, könyvnyomdász, Nagybecskerek. Jó munkáért..
Pesti Lloyd-társulat, könyvnyomdatulajdonos. Budapest. Versenyképesség és jó munkáért.
Pannonia-könyvnyomda, Győr. Jó izlés és jó munkáért.
Pratchinger Ödön, könyvkötő, Győr. Jó munkáért.

Data: creating the panel by linking data tables

- Create a panel via entity resolution
  - Person name, incorporated : Kovacs bunda, Kovács és fia bunda, Kovács szőrme Rt ("bunda = " fur coat", "szőrme" = fur, "Rt" = joint stock):
  - Great deal of human work, check, identify.
- Create UID, link companies across datasets

Possible Outcomes

Focus on today

- Export propensity: $Pr(export\_status = 1)$
- Firm size change: $\Delta log(worker\_num_t)$

In the pipeline

- Machine capacity change: $\Delta log(hp\_num_t)$
- Multi-location: $Pr(multilocation = 1)$
- Joint-stock: $Pr(joint\_stock = 1)$
- Patent: $Pr(patent = 1)$

Results

Regress export status using controls and comparison class effects

- Cross section OLS for export status (export start and keep on) (DiD)

$$export\_1904_{i(j)} = \alpha + \beta_1 \text{exhibitor}_i + \beta_2 \text{export\_1898}_i + \gamma \text{Budapest\_class}_j + \delta X_i + \epsilon_i \quad (1)$$

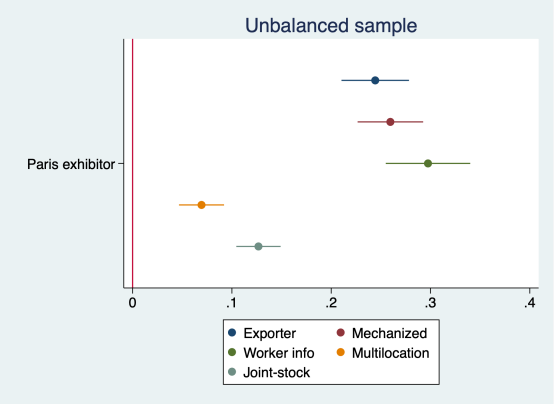
  - $y_{i(j)}$ is the export status for firm i in Budapest award class $j = 1, 2, 3, 4$
  - exhibitor_i is a dummy for attending Paris exhibition in 1900
  - Budapest_class_j is the effect of belonging to either one of the Budapest award classes or one of the downward-biased Budapest classes
  - X_i industry, region, technology dummies

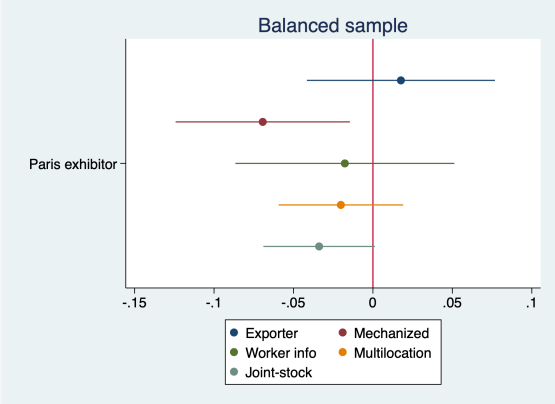
Consequence of identification, and the idea of balancing test

- Observable / unobservable characteristics such as technology, management, innovativeness **might be correlated with Paris exposition AND export status**.
- **Our identification strategy** of comparing not *within* award category but *across* (TG: Silvers vs CG: Gold, etc) should take care of confounders:
  - We would expect confounders to be positively correlated with award classes (and Paris attendance).
  - By choosing the CG from a *higher* award class we bias our estimate downwards.
- **Balancing test** = check observables, and show that our reseach design yields balanced (=similar) values across TG and CG

Identification generates balanced sample in terms of controls I. (binary)

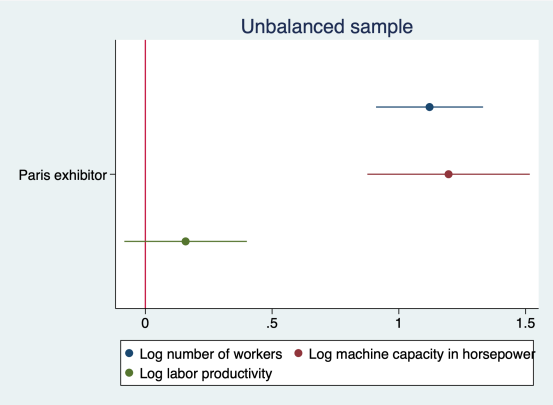
In terms of 1896 (Budapest) control variables, after dropping firms for identification, we get T and C samples similar in observables.

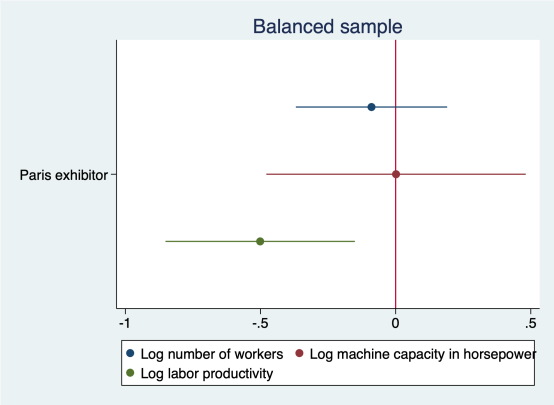




Identification generates balanced sample in terms of controls II. (numeric)

In terms of 1896 (Budapest) control variables, after dropping firms for identification, we get T and C samples similar (or going against result) in observables.





Results for the 1904 export status indicator: full sample

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Paris exhibitor	0.178***	0.152***	0.132***	0.136***	0.122***	0.093***
	(0.0160)	(0.0162)	(0.0164)	(0.0242)	(0.0270)	(0.0282)
Export status 1898	Yes	Yes	Yes	Yes	Yes	Yes
Industry, region indicators	No	Yes	Yes	No	Yes	Yes
Other controls	No	Yes	Yes	No	Yes	Yes
Budapest award: class dummies	No	No	Yes	No	Yes	No
Budapest award: downward biased	No	No	No	No	No	Yes
Observations	3,678	3,678	3,678	1,506	1,506	1,506
R-squared	0.437	0.460	0.467	0.369	0.408	0.409

Sample of firms: (1)-(3) all exhibiting companies in Budapest where industry and region info is available. (4)-(6) excludes firms where award class cannot be compared (class 1 attendees and class 4 non-attendees) as well as last comparison class (class 4 – no award). Other controls are worker and mechanization info in 1896.
Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Results for the 1904 export status indicator: selected sample

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Paris exhibitor	0.178***	0.152***	0.132***	0.136***	0.122***	0.093***
	(0.0160)	(0.0162)	(0.0164)	(0.0242)	(0.0270)	(0.0282)
Export status 1898	Yes	Yes	Yes	Yes	Yes	Yes
Industry, region indicators	No	Yes	Yes	No	Yes	Yes
Other controls	No	Yes	Yes	No	Yes	Yes
Budapest award: class dummies	No	No	Yes	No	Yes	No
Budapest award: downward biased	No	No	No	No	No	Yes
Observations	3,678	3,678	3,678	1,506	1,506	1,506
R-squared	0.437	0.460	0.467	0.369	0.408	0.409

Sample of firms: (1)-(3) all exhibiting companies in Budapest where industry and region info is available. (4)-(6) excludes firms where award class cannot be compared (class 1 attendees and class 4 non-attendees) as well as last comparison class (class 4 – no award). Other controls are worker and mechanization info in 1896.
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Results for the 1904 export status indicator: our identification

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Paris exhibitor	0.178***	0.152***	0.132***	0.136***	0.122***	0.093***
	(0.0160)	(0.0162)	(0.0164)	(0.0242)	(0.0270)	(0.0282)
Export status 1898	Yes	Yes	Yes	Yes	Yes	Yes
Industry, region indicators	No	Yes	Yes	No	Yes	Yes
Other controls	No	Yes	Yes	No	Yes	Yes
Budapest award: class dummies	No	No	Yes	No	Yes	No
Budapest award: downward biased	No	No	No	No	No	Yes
Observations	3,678	3,678	3,678	1,506	1,506	1,506
R-squared	0.437	0.460	0.467	0.369	0.408	0.409

Sample of firms: (1)-(3) all exhibiting companies in Budapest where industry and region info is available. (4)-(6) excludes firms where award class cannot be compared (class 1 attendees and class 4 non-attendees) as well as last comparison class (class 4 – no award). Other controls are worker and mechanization info in 1896.
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Discussion

- The causal effect of Paris exhibition is between 9% and 12% – the probability of becoming an "export status" company in 1904 (given 1898 status) grew by 9-12 percent.

Regress firm growth using controls and comparison class effects

- Cross section OLS for firm size growth (DiD)

$$\Delta worker\_num_{i(j)} = \alpha + \beta_1 \text{exhibitor}_i + \beta_2 \text{worker\_num\_1896}_i + \gamma \text{Budapest\_class}_j + \delta X_i + \epsilon_i \quad (2)$$

  - $y_{i(j)}$ is ln number of workers for firm i Budapest award class $j = 1, 2, 3, 4$
  - exhibitor_i is a dummy for attending Paris exhibition in 1900
  - Budapest_class_j is the effect of belonging to either one of the Budapest award classes or one of the downward-biased Budapest classes
  - X_i industry, region, technology dummies

Results for log worker change between 1896 and 1904

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Paris exhibitor	0.290***	0.287***	0.261***	0.227***	0.244***	0.196*
	(0.0707)	(0.0746)	(0.0761)	(0.0784)	(0.0834)	(0.1010)
Worker 1896 level (ln)	Yes	Yes	Yes	Yes	Yes	Yes
Industry, region indicators	No	Yes	Yes	No	Yes	Yes
Other controls	No	Yes	Yes	No	Yes	Yes
Jury award class effects	No	No	Yes	No	No	No
Comparison class effects	No	No	No	No	No	Yes
Observations	482	482	482	311	311	311
R-squared	0.131	0.185	0.192	0.094	0.176	0.189

Sample of firms: (1)-(3) all exhibiting companies in Budapest that also appear in the 1904 dataset, where industry and region info is available, and have employment information in both years. (4)-(6) excludes firms where award class cannot be compared (class 1 attendees and class 4 non-attendees) as well as last comparison class (class 4 – no award). Other controls are mechanization info in 1896 and export status if 1898.
Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Discussion

- The causal effect of Paris exhibition is between 20% and 25%.

- Non-exhibitors grew approx. 1 percent per year
- Exhibitor firms grew 2.3-2.8 percent more per year.

Conclusion

- Paris exhibition attendance in 1900 increases the probability of exporting and yields faster growth
- Our method, using Budapest trial expo, creates a bounded estimate
- Both bounds below simply using 1900 observables.

Thank you for your attention!

Comments welcome:

[Gabor Bekes]
(bekesg@ceu.edu)

[Claudia Steinwender]
(claudia.steinwender@econ.lmu.de)

[Matyas Molnar]
(molnar_matyas@phd.ceu.edu)

LE PALAIS DES ILLUSIONS

C'est une vaste salle hexagonale restituée, sur ses six côtés, d'immenses glaces de Saint-Gobain, et couverte par un plafond doré, sculpté dans le style mauresque par M. Almeras. Une série de lampes électriques, installées avec le plus grand art par MM. Piccu et Martine, éclairent de tons variés et changeants des colonnes, des appliques, des girandoles qui se reflètent à l'infini, et donnent l'illusion d'une féerique mosquée illuminée de cent mille feux.